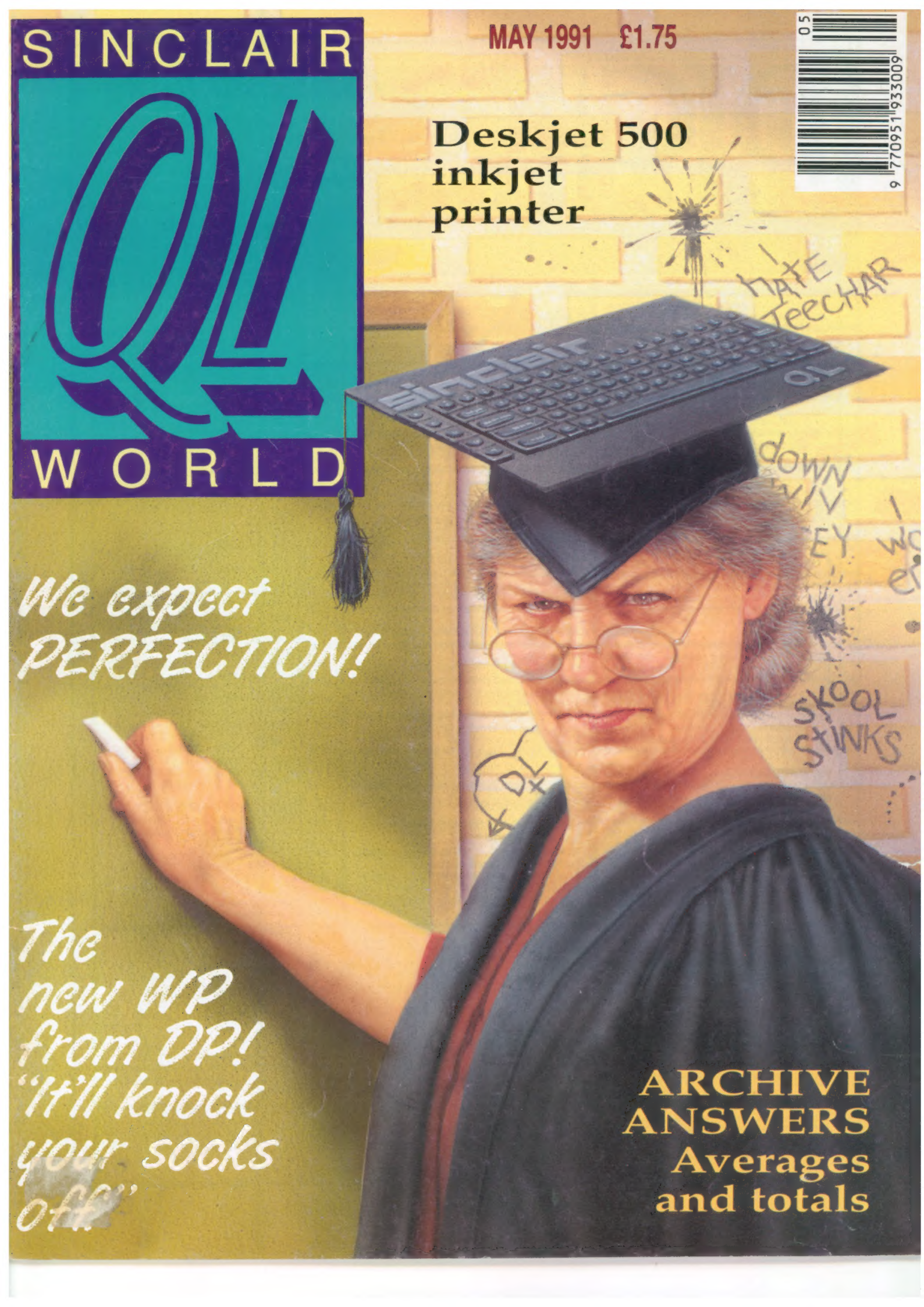
SINCLAIR QL WORLD

MAY 1991 £1.75

Deskjet 500 inkjet printer



We expect PERFECTION!

The new WP from DP! "It'll knock your socks off"

ARCHIVE ANSWERS
Averages and totals

DJC

Dilwyn Jones Computing

41 Bro Emrys, Tal-y-Bont,
Bangor, Gwynedd LL57 3YT
Tel: Bangor (0248) 354023

QUESTION MASTER ***by C.B. Storey*** **£10.00**
NEW! A multiple choice question and answer system, extremely simple to use and with an example file supplied. Use it for revision, or just for fun! Quiz editor included to make your own question and answer sets, or try these:
General knowledge quiz questions £5.00
Classical music quiz questions £5.00

SCREEN ECONOMISER ***by G. Estournet £10.00***
NEW! Protect your monitor's screen! If you don't press any key on the keyboard for more than a set number of minutes (1 minute to 4 hours, default 10 minutes) the QL's display is turned off until you press a key on the keyboard to restart the display, to help reduce or prevent a static image being 'burned' into the screen phosphor. OK for expanded QL. Taskmaster users — a similar facility is built into Taskmaster.

TRANS 24 ***by Ralph Rekondt*** **£10.00**
NEW! If you have a 24 pin printer, but your graphics programs don't have 24 pin drivers (e.g. Page Designer), print the output to a file if the program can do this, then this filter program translates the 9 pin bit image data into 24 pin format and corrects the line spacing if possible, so you can take advantage of the quality of graphics printing from 24 pin printers.

VISION MIXER ***by Dilwyn Jones***
The original Vision Mixer screen display, effects and advertising software. See John Shaw's review in QL World, January 1991 for more details.

VISION MIXER PLUS ***by Joe Haftke***
A new, enhanced version of the popular Vision Mixer software. More features than Vision Mixer 1 and even easier to use. Ask for further details!

PICTUREMASTER ***by Joe Haftke***
Screen making utility for use with both Vision Mixers. Text captions, graphics, mode 4 & mode 8 colours, etc (NB — all 3 programs need min. 256k RAM)

VISION MIXER PLUS	**(disc only)**	**£22.50**
PICTUREMASTER	**(disc only)**	**£15.00**
Both together — save 20%!		**£30.00**
VISION MIXER 1 (disc only)		**£10.00**
Upgrade Vision Mixer 1 to Vision Mixer Plus (quote serial number)		**£14.50**
PICTUREMASTER + upgrade		**£24.00**

WINBACK ***by Norman Dunbar £25.00***
Hard disc backup utility, specifically intended for Miracle Systems hard disc and compatibles. Specify directories, backup dates and listings if required. Requires Toolkit 2 to run.

POLYTEXT ***by Nick Ward £16.00***
Multi column NQL text output from Quill! Rearrange the output from Quill, with bold, underlining plus italic and draft/NQL via translates. Justify text. Use elite, condensed, expanded and double height printing, footers, even small graphics. Up to 7 columns of output. SAE for sample printout. Suitable for unexpanded QL.

DISCOVER ***by Dave Walker £20.00***
QDOS to PC disc format transfer. 256k, disc only. SAE for details.

MULTI DISCOVER ***by Dave Walker £30.00***
As Discover, but also transfers to BBC DFS/ ADFS, CPM (many formats) and to Unix CP10 format. 256k, disc only.

TEXTIDY ***by Dave Walker £15.00***
Text file conversion utility. Convert Quill _doc files to plain text for other QL text editors, or use with Discover, to transfer to a PC for DOS Quill format, to Wordstar (PC) and vice versa. Also converts Archive screen files to DOS format for transfer to PC Archive. Available on disc only.

TASKMASTER ***by Peter Jefferies £25.00***
Multitasking front end utility, calculator, notepad, printer buffer etc.

FILES 2 ***by Peter Jefferies*** **£12.00**
Enhanced version of Taskmaster files utility — add to Taskmaster or use by itself. View/copy/ delete/etc files.

SPELLBOUND ***by Peter Jefferies*** **£30.00**
30,000 word dictionary, check spelling as you type, expandable dictionary.

SPELLBOUND SPECIAL EDITION **£50.00**
New version of Spellbound, larger dictionary, retrospective spell-check, turns itself back on automatically at the start of new words.

UPGRADE SPELLBOUND TO SPELLBOUND S.E. **£30.00**
Return spellbound master plus (NB Spellbound S.E. is on disc only)

FLASHBACK ***by Peter Jefferies*** **£25.00**
Excellent fast, versatile database

FLASHBACK SPECIAL EDITION **£40.00**
Enhanced version of Flashback — new commands, report generator, mailmerge, label printing etc.

HOME BUDGET ***by Joe Haftke*** **£20.00**
Personal income tax calculator (UK only plus domestic bills and accounts budgeting system. A very easy system to use. Please note: the Income Tax calculator is intended for UK use only. SUitable for unexpanded QL.

QUICK POSTERS ***by Dilwyn Jones*** **£10.00**
Make text posters quickly and effortlessly with this program. Large text, centering, NLQ, reconfigurable printer driver, etc. NB Check printer compatibility with us before ordering, suitable for use with most 24 pin printers and some 9 pin printers such as Star NL10 & LC10. Suitable for unexpanded QL.

BASIC REPORTER ***by Dilwyn Jones*** **£10.00**
BASIC programming aid. Lists variable names, procedure and function names, extensions, line numbers, addresses and so on. Helps you debug BASIC programs and spot typing mistakes etc. Works on unexpanded QL.

COCKTAILS WAITER ***by Imre Dominik*** **£10.00**
Cocktail drinks recipes database. Over 400 recipes supplied with the program. Great for parties, or for when you have guests or friends around! Browse through the database, find drinks you can make with a given ingredient, add to the database. Works on 128k QL
EXTRA RECIPE SETS,
2 SETS AVAILABLE

MIX2 — around 400 extra recipies	£5.00
MIX3 — includes non-alcoholic	£5.00

SUPER DISC LABELLER **£10.00**
Print neat labels for your discs showing sorted filenames on the disc plus any text you care to add. Preview to the screen, make disc backup copy with sorted directory. Reconfigurable printer driver and label sizes — use our printer tractor-fed disc labels if you want to (see below). 256k RAM.

QL GENEALOGIST ***by Chris Boutal*** **£19.50**
Record and print your family tree with this comprehensive genealogy database. See the review in QL World Jan. 1991 for further details — John Shaw described it as "guaranteed to make even the most fastidious and exacting Family Historian go wild with delight." Send an SAE for further details of this superb program. Specify 128k or expanded memory version when ordering.

SUNDRY COMPUTER SUPPLIES

3.5" DSDD unbranded discs, with labels	£0.50 each	3.5" SONY BRANDED DISCS WITH LABELS	£1.00 each
20 or more unbranded discs	£0.45 each	Pack of 10/ 2 packs or more	£9.50/£9.00
5.25" unbranded DSDD 80 track discs	£0.35 each	New Sinclair microdrive cartridges	£2.50 each
Disc labels, roll of 100	£2.00	Labels for microdrive cartridges	£2.00 /100
Disc labels, 100 on printer feed roll	£2.50	Address labels, on printer feed backing	£2.00 /100
40x3.5" disc storage box (lockable)	£5.00	80x3.5" disc storage box (lockable)	£7.00
10x3.5" disc storage box (Ryford)	£1.20	Monitor stands, up to 14", tilt and swivel	£15.50

Printer ribbons — we can obtain most types. If your type is not shown, ask and we may be able to order it for you. LC24-10, LC10, Citizen 120D, Brother HR5/M1009 etc, Centronics GLP/GLP2, Epson FX/RX/MX80 etc, PW1080/Kaga Taxan KP810, Juki 6100, Shinwa CP80 and many more normally held in stock, prices from £4.00 each. If you are only ordering ribbons, please ignore the postage charge shown below and add £0.50 per ribbon for postage and packing in UK, £1.00 abroad.

TERMS — Postage — UK, add £2.50 postage and packing, except to software only orders, which are post free. EC countries — please add £3.50 postage and packing, except to software only orders, to which you should add £1.00 per item for postage. Other countries — add postage at cost, and remember airmail is more expensive than surface mail. If in doubt, add 10% to order value, minimum £3.50 abroad. Please make payment, in Sterling only please (your bank can tell you how to send Sterling from abroad, for example by Eurocheque, payable to DILWYN JONES COMPUTING. We regret that we are not yet able to offer credit card payment facilities, but may be able to arrange Cash On Delivery terms in the UK only, for a small charge, if required (please enquire if you do require this service). Goods remain the property of Dilwyn Jones Computing until paid for in full. Send an SAE for further details of the program or progress you are interested in and a full price list.

SINCLAIR QL WORLD

Editor
Helen Armstrong

Production Controller
Jayne Penfold

Designer
Jeff Gurney

Advertising Manager
Jason Newman

Magazine Services
Yvonne Taylor

Advertising Production
Michelle Evans

Group Advertising Manager
Jean Dorza

Group Editor
John Taylor

Deputy Managing Director
Ray Lewis

Managing Director
Peter Welham

Sinclair QL World
Panini House
116-120 Goswell Road
London EC1V 7QD
Telephone 071-490 7161
ISSN 026806X

Unfortunately, we are no longer able to answer enquiries made by telephone. If you have any comments or difficulties, please write the The Editor, Open Channel, Trouble Shooter, or Psion Solutions. We will do our best to deal with your problem in the magazine, though we cannot guarantee individual replies.
Back issues are available from the publisher price £2 U.K., £2.75 Europe. Overseas rates on request.
Published by Maxwell Specialist Magazines, A Division of MCPC Ltd., Sinclair QL World is distributed by IPC Market force, King's Reach Tower, Stamford Street, London SE1 9LS.
Subscription information from: MSM Subscription Dept, Lazahold Ltd., PO Box 10, Roper St, Pallion Ind. Est., Sunderland SR4 4SN. Tel: 091 510 2290
UK: £21.00, Europe: £32.00, Rest of the World: £38.00.

Typesetting by Ford Graphics, 8-10 Whitsbury Road, Fordingbridge, Hampshire. SP6 1BR. Tel: (0425) 655657
Printing by Cradley Print. (0384) 411411
Sinclair QL World is published on the third Thursday preceding cover date.

© COPYRIGHT
SINCLAIR QL WORLD – 1991

CONTENTS

MAY 1991

9 QL SCENE ● New Q_Liberator
10 OPEN CHANNEL ● Tell us more!
12 TROUBLESHOOTER ● Long Letters
15 QL SCENE ● Essex meeting cancelled
16 ARCHIVE ANSWERS ● Totals and averages
18 PERFECTION ● Now! The new WP from DP
25 THE NEW QL USER GUIDE ● Part 3 – The screen
29 EDITOR'S NOTICE BOARD
30 SOFTWARE FILE ● DBEasy
34 SOFTWARE FILE ● Cocktails Waiter
37 MICRODRIVE EXCHANGE
38 HARDWARE REVIEW ● Deskjet 500 ink jet printer
42 DIY TOOLKIT ● SET – the listings
50 INSTANT ACCESS
BACK COVER – SUBSCRIPTION INFORMATION

NEXT MONTH

LEARN TO LOVE YOUR PRINTER
Part 2 of Bryan Davies' introduction to printer control.

QUILL IN ASPIC
Taking your Quill output to the typesetter.

PERFECTION
PERFECTION PLUS

NEW!

DIGITAL PRECISION LTD

Not just a word-processor - this one is THE word processor.
From the same inspired team who brought you classics like LIGHTNING SPECIAL EDITION and PC CONQUEROR, Digital Precision presents a product that will revolutionise the way you use your QL. Let us tell you how **PERFECTION** will do this.
Several hundred thousand QL users have grown familiar with the free word processor that was bundled with the QL. On the plus side, its use could be mastered in a few minutes thanks to its simple menu system, and it is reasonably WYSIWYG (What you see is what you get) in appearance. On the minus side, it is very slow, sometimes idiosyncratic (in what it prevents you from doing, or the roundabout way in which it forces you to go about things that should have been straightforward) and very many commands that we think should have been provided with it simply weren't. Valiant attempts to accelerate it by "patching" it have achieved only a 20% speedup.
There is, however, no getting away from the fact that the majority of QL owners still use Quill as their main program. They have grown used to the user interface of the bundled programs, and are reluctant to invest time in learning some totally incompatible system, whatever its claimed advantages might be. So - using their ingenuity, for QL people are an ingenious tribe - users have put up with the inadequacies and slowness, and enjoyed Quill's friendliness.
You are probably just such a QL user yourself....
Now here is a product CREATED JUST FOR YOU.
A word processor that you can master in just a couple of minutes.
A word processor whose user interface uses precisely those keys that you would expect it - from intuition or experience - to use.
A word processor that is menu-driven (multiple page menus) so there is absolutely no need for you to remember anything or ever refer to the manual: the menu is on the screen all the time. A word processor that is intuitively obvious to operate: even more obvious than was the bundled one. If you have become at all used to the F3 interface, you will love this enhancement! A word processor that is designed for Absolute Beginners and Advanced Users, for Complete Wallies and for Albert Einsteins alike.
A word processor that is delightful to use for letters and documents of but a few pages as well as for articles, journals, magazines, books, theses or manuscripts hundreds of pages long.
A word processor that can unleash the power of your printer, whatever its make, and squeeze the very best from it. A word processor with a very flexible user-configurable printer driver: one, however, that you should never have need to configure(!), as it works as shipped with Epson-compatibles and most non-compatibles, and if you have an esoteric printer, it can utilise your existing configured Quill printer data file, automatically, if you want it to! With this word processor you do not have to buy any extra printer drivers - you get everything you need right from the start.
A word processor with full on-screen indication of character mode - bold (i.e. emphasised) appears bold on screen, underline appears underlined, italics appear in italics, superscript and subscript appear superscripted and subscripted.... Other "special" type modes - dependent on the capabilities of your printer, like switching fonts, pitches, NLQ/draft mode, proportionality, double-strike, or anything else you choose - are indicated on screen by variations in ink/strip colour combinations, just as the most advanced PC word processors do. You can even make up your own "attributes" to be displayed on-screen in a particular ink/strip. Combinations of attributes are permitted - the display copes fine. Never before have things been so clear and simple....
That **PERFECTION** manages to do all this is remarkable. That it manages to do it at all fast would be amazing. But the truth is, in fact, much much better. **PERFECTION** is by far the fastest word processor for the QL, being DOZENS of times faster than Quill on many operations (a minimum of five times faster than it on everything), and - yes - many times the speed of our own beloved and excellent Editor, and far far ahead of all the others.
This may seem impossible to you. Two years ago, before we started work on **PERFECTION**, it would have seemed impossible to us as well! But a remarkable bit of software technology has enabled us to achieve this incredible acceleration. Of course you don't need to know or understand how we have accomplished all this in order to enjoy to the full the benefits of **PERFECTION** speed: if you want to know anyway, look at the technical section later on.
If you already use Quill or ANY OTHER QL WORD-PROCESSOR, you will be overjoyed to know that **PERFECTION** can load your existing saved files (_doc or _lis or ASCII) directly, with no conversion process required. This - together with the automatic reading of existing printer driver data - takes all the trauma out of the move to an exciting new system! And **PERFECTION** files are usable with PC/ST/Amiga word processors too.
PERFECTION comes with a multi-function configurator that allows you - if you want - to tailor-make a version specific to your tastes. Practically everything that is settable at run-time is also pre- configurable, making **PERFECTION** comfortable to operate. As you become more familiar with **PERFECTION** and no longer need the menu options to be visible all the time, you can toggle the menu off, freeing all the screen for your document. You can configure **PERFECTION** so that on startup the menu is either visible or not. As you become even more familiar with **PERFECTION**, you can opt to bypass the menu system entirely, and use alternative direct keypress commands to access **PERFECTION**'s power even more rapidly.
PERFECTION natively multitasks (of course) which means that without any other tools you can run multiple copies of it simultaneously, as well as run it at the same time as other pieces of software. Even if you choose to run only one copy of the program, you still have the option to look at more than one part of the document at the same time. You can take a "snapshot" of part of the document, and keep that snapshot in view as you edit a totally different area of the document. Ideal for indexing or cross-referencing. You can set up macros so that making a glossary is easy. Also, you can have any number of blocks - not just one - defined in the document. You can undo/edit attribute changes with a single keypress - there's no need to laboriously "paint" over areas or navigate to the start and end of a highlighted area in order to adjust the attribute!
Being able to cope with human error is an important part of **PERFECTION** philosophy. For example, not only is there an Undo option, but you can also ESCape from any command. When you have right justification on **PERFECTION** will add pseudo-spaces to pad out the line. Pseudo-spaces look like spaces and print like spaces but when you left justify they are removed while real spaces - the ones you have entered (via the SPACE bar or TAB) are not. This means if you accidentally right-justify tabular or columnar data, a simple left-justify will get it back to its exact original state. Most other word processors do not distinguish between spaces you have entered and spaces they have inserted, and hence cannot auto-recover.
Many users need the uuse (sic) of a spelling checker with their word processor. Adequate spelling checkers already exist for the QL, and for users who either do not want a spelling checker, or who do not want one as yet, or who already have one and are on a tight budget, we supply a version of **PERFECTION** without any built-in checker. But to get the best out of **PERFECTION**, we also supply it bundled with a dedicated Spelling checker of unsurpassed speed. There are even two levels of dictionary supplied (you get both) - the larger one is 225,000 words (no more hassle of having a checker which doesn't know the words you use: this dictionary is about 400% larger than its nearest competitor!) and a compact one: use the latter if you are short of memory, or when your document is really huge. You can add new words to the dictionary as well as create new dictionaries. With either dictionary **PERFECTION** PLUS one checks as you type, or checks saved files, or - BEST OF ALL - spell-checks interactively from any one point in the document to another....
If you already have our Editor Special Edition and use it for documents, database work or programming, you will find **PERFECTION** a wonderful treat. **PERFECTION**'s WYSIWYG behaviour, greatly enhanced document facilities ("tells you everything" status line, available word/line/character counts, regular and forced page breaks, headers and footers), menu-driven options and VERY MUCH GREATER SPEED make it an ideal upgrade. There are hundreds of detailed changes - to give but one: paragraphs do not need to have a blank line between them in order to distinguish them any more. There remains an area, however, where Editor Special Edition remains supreme - the editing of "non-printable" data, the ability to handle the entire ASCII character set from codes 0 to 255. So if you are a technical or semi-technical user and do not have either Editor Special Edition or **PERFECTION**, your best buy is the two programs together (they can interact, coexist, work simultaneously and have fully-compatible file formats). You will then get Editor Special Edition at HALF PRICE (Special Offer - limited duration).
The characteristics of a good database are its ability to Store, Retrieve and Manipulate information rapidly. By this criterion, this word processor makes an ideal database system too, as it is blindingly fast and flexible. Forward and backward 'Search' takes at most a couple of seconds, even when you have a document that fills an 896K Trumpcard system to the brim! Cursor navigation is also unbelievably fast and smooth, with an accelerating rate of scrolling if you indicate impatience. And there are macros, programmability and more for the more advanced user. If you have been unhappy with the speed or complexity or non-programmability of your existing database, **PERFECTION** will solve your problems. **PERFECTION** can even access your existing Archive export files.
And if you want full desktop publishing capabilities (the use of fonts that your printer does not possess, and graphics) interlinking **PERFECTION** with Professional Publisher is a doddle. Use **PERFECTION** for creating, editing and manipulating, and "pour" the result into Pro Publisher.
But first and foremost **PERFECTION** is a user-friendly, familiar user-interface, stand-alone WYSIWYG dual-control (menus or direct commands) word processor of enormous power and blistering speed, which (for the first time) makes output to printers hassle-free. There is nothing else like it or even remotely as good as it on the QL or on anything else. **PERFECTION** is our best yet.
PERFECTION is for you whether you hate your existing word processor, are indifferent to it or love it. **PERFECTION** will let you forget about all the technology and concentrate only on the writing.
PERFECTION costs just £79.95 including integrated printer drivers, ancillary programs and jargon-free, friendly but to-the-point documentation (that you will probably never need to read through!). **PERFECTION** PLUS comprises **PERFECTION** plus the dedicated Spelling checker with dictionaries and costs just £119.95.

TECHNICAL INFORMATION ON PERFECTION

You don't actually need to read or understand this.
PERFECTION gets its superb speed from two sources. Firstly, **PERFECTION** - unlike virtually any other word processor - is written entirely in 100% hand-written machine code. This gives us a considerable speed advantage over compiled alternatives. Had we written **PERFECTION** in a high level language it would have been 4 times slower, 6 times bulkier and taken us a great deal less time to produce. You reap all the benefits of our hard work.
The other source is design. There are two formats for internal data storage for character handling programs. Many store data serially, in a long stream of characters. Ones like Editor store data as lines scattered through RAM, with a table of pointers to the lines - a far more advanced method. The first format has the advantage that it is cheap to program - the user pays the cost in terms of performance, with sluggish block-defining/moving, navigation and insertion. The second format has advantages including instant random access to any line and quick insertions and deletions - the disadvantages may include heap fragmentation that will result from repeated grabbing of small chunks of space (garbage collection may be required periodically if space is short). Both formats share the disadvantage that "global" changes made to a part of the document - say a switch to bold at the top - will take a long time to filter down through the system to become visible on-screen at lines at the bottom.
PERFECTION uses a variant of the second format that does not have its disadvantages. Data is stored in RAM in optimally-sized chunks - a chunk being roughly the size of several screens. Each chunk has a control information area within it about the number of lines etc within it, the display status at the start of it (say bold on, italics/underline etc off). Whenever you are editing, the relevant chunk(s) are instantly loaded into a large work area that has slack space at both top and bottom. That means that you can add or delete a great amount of data instantly, without **PERFECTION** having to bother about updating anything but the work area. Only when you move over the edge of the work area will **PERFECTION** need to housekeep outside the work area: the housekeeping itself is then very very fast, as only control information areas need to be updated. There is no need for a general scan through all following text. There are many more speed and power advantages to our system. There is one big disadvantage - it is an absolute nightmare to design and implement! Fortunately for you, you don't have to know anything about it - it just works like clockwork, automatically and behind the scenes.
Other elements of **PERFECTION** design to enhance performance include lazy screen (when you keep a key pressed in order to get somewhere, we stop updating the whole screen and instead just scroll the line your cursor is on) and lazy attributes (where in a huge document of hundreds of pages you do a long jump - say from near the top to near the bottom, in one go, and we have not yet resolved the attribute status (say underline on) of the area you want to get to, we don't hold up the display for even one hundredth of a second while we are computing attributes, but display the new area immediately without any pause - the attributes will 'catch up' a second later: you will only see this if your document is very very big and you navigate in huge leaps). Also, there is a garbage job running all the time in the background, doing whatever internal tidying up and optimising is needed when you are not doing anything (with **PERFECTION**'s speed, even if you are typing at 200 wpm the program is sitting twiddling its thumbs for 90% of the time as it awaits input!). Consequently, **PERFECTION**'s internal tables are always in a PERFECT state. Both lazy screen and cursor acceleration are user-configurable, incidentally.
There are dozens of other more localised ways in which **PERFECTION** performance is obtained. For example, **PERFECTION** has built-in knowledge of statistical distribution of occurrence frequencies for the various alphabetic characters in English and other European languages. It uses this data as follows: if you ask **PERFECTION** to search for the word 'praxis' in your document, we won't look for the 'p' first. Instead, we automatically look for an 'x' (less occurrences of 'x') and having found 'x' then resolve whether it is embedded within an occurrence of 'praxis' (if not, we search for another 'x'). Obvious? We thought so. But no one else appears to be using this excellent trick. Or dozens of other tricks that we'd prefer to keep to ourselves...
For those with advanced needs, **PERFECTION** features include full programmability - more than just macros - with the ability to save and re-execute programs. There are over a hundred commands.
You will be relieved to note that **PERFECTION**'s file format is very clean, containing one short header (giving the margin/TAB etc data for that document) and then exactly what you typed in (no mass of pointers or counters). Changes of attribute (bold, NLQ, underline etc) that you have opted for are stored as control characters (we document the structure) in the appropriate places in the file - note that while the control characters themselves (as opposed to their effects, which are WYSIWIG'd on-screen) are invisible when you are viewing the file, you can edit/delete them (search for the next or previous bold text, say!) and even program the access to them (swop all bold for double-strike plus underline)... You can even opt to Export so the header is suppressed, to enable its direct use as a programming or technical front end, or to allow its output to be read in by other word processors (QL, PC or whatever).
The net result of all this is that in terms of features and performance, **PERFECTION** running on a QL will beat most word processors even running on state-of-the-art £7000+ 486 PCs... In a nutshell, **PERFECTION** will blow your socks off.

LIGHTNING SPECIAL EDITION
LIGHTNING

Until the autumn of 1989 the fastest way of speeding up your QL display was to buy **Lightning**, which greatly accelerated QL text printing, graphics and maths, without affecting compatibility at all. NOW you can buy **Lightning** Special Edition, which is significantly faster than **Lightning** and does a lot more! **Lightning** Special Edition is simplicity itself to use. Once it is loaded ALL programs will AUTOMATICALLY benefit from the enhancements it provides. If you are using a QL without **Lightning** you are probably a little pale (quote from John Norton of Sector Software), you should get out and about more... Go to some QL shows or meetings where you will see **Lightning** in action - or take our word for it. If you don't have **Lightning** you are WRONG.
Lightning Special Edition works by automatically (I know we keep using the word, but it is the only one that is really correct here) and instantly replacing QL ROM code (or Minerva code, for that matter - Minerva and **Lightning** complement each other superbly) that has usually been optimised for space, with extremely high speed routines written by us that do the same job but much faster. Screen output speed gets accelerated by factors from over 1.5x to over 10x (about 2x-4x is representative), graphics are drawn twice as fast (points are plotted 5 times faster) and internal maths is speeded up by 2x-5x (you can even vary the precision). There is virtually no cost in RAM (for example, you can still run Quill with a fairly large document on an unexpanded QL with **Lightning** Special Edition).
The Special Edition is supplied on EPROM plus disk/cartridge: if you already have something precious plugged into the QL's EPROM socket (at the rear), there is no problem - all the EPROM's functionality is duplicated on the other medium!
Lightning Special Edition provides more than acceleration - you can dynamically adjust channel parameters - like ink, paper, font, screen position, use over 80 fonts, a null device, a character drain and all sorts of other interesting gadgets.
Lightning Special Edition installation has been totally automated, and will not present you with complications no matter how computer-naive you are.
If you cannot afford the Special Edition, get **Lightning**. Refer to its review in September 1988 QL World to see how effectively **Lightning** acquitted itself.
Both of these programs transform the QL into an altogether more zippy, business-like, efficient, enjoyable machine.

PC CONQUEROR WITH DR-DOS v5.0
PC CONQUEROR

Terrific though we know the QL to be, we do feel the pressure to be "PC compatible" in today's world. There is increasing demand to be able to bring home and run the programs we use at work (or the other way around!), and to have access to the vast storehouse of PC software: word processors, databases, spreadsheets, expert systems, accounts and financial modelling packages, vertical market applications, visualisation aids, graphics/CAD/PCB designers, languages/compilers, operating systems, environments, utilities, adventures - you name it, there are scores of each type readily available for the PC. And thousands of shareware/PD programs, too, most for the cost of a blank disk plus postage.
If you buy PC **Conqueror**, you will be able to run these programs! To boot up PC **Conqueror** takes 10 seconds from the F1/F2 prompt: thereafter, your QL is a HIGHLY compatible PC clone (indeed, more compatible than some "real" PCs). **Conqueror** is all-software. There is no comparison in quality between **Conqueror** and its predecessor: **Conqueror** has ALL the features of Solution (read the details later in this ad if you are unfamiliar with Solution's legion facilities), but is almost TWICE as fast: this has come about by our careful rewriting and optimising of Solution's code. As if the colossal speedup was not "enough", **Conqueror** (unlike Solution) runs perfectly even with PC software that makes various "non-legal" calls to the PC operating system. **Conqueror** runs with virtually anything that will run on a PC: QL Worlds from December 1989 to March 1990 listed several hundred PC programs/utilities found to work with **Conqueror**. It is simpler to say that we have yet to find a program that runs fine on a standard PC that doesn't run with **Conqueror**: we are aware, however, of programs that will run with **Conqueror** but won't run on some PCs!
Because in **Conqueror** we've cracked the problem of detecting when the PC screen has been changed, we need not slavishly update the screen many times a second (taking precious time away from the main PC-emulation job) as did Solution. Instead, we update the screen instantly it needs to be updated. This simple to understand but very hard to implement modification gives **Conqueror** additional (over and above what we've already discussed), "tunable" acceleration, as well as absolutely smooth echoing of keyboard input to screen (Solution could be a bit jerky when you typed quickly).
Conqueror's new features include a more flexible configurator and a better diagnostic and supervisor option, an enlarged manual (**Conqueror** itself is more compact!) with a troubleshooting chart, and a new mode of operation (in addition to the "normal" one of reading/writing PC disks directly) which allows you to create mini PC environments - you select the size, location and name - on any QL device (including floppy, ramdisk, hard disk and even mdv) which look like files from QDOS (and can therefore be copied with SuperBASIC's COPY!) but are indistinguishable from PC drives from within DOS (**Conqueror** works with all versions of DOS).
If you do not have legal access to a copy of DOS, you need to buy DOS too (DR-DOS or MS-DOS)- but we sell the complete DR-DOS (with Viewmax, Shell, Cache and all system utilities) at c 1/2 price!
Of course QLs are better than PCs - but QLs that are PCs as well are better still. We will leave the last word to people who have already bought **Conqueror**. All these sentiments are unsolicited.
"I wish to congratulate you on the excellent work you have done on Conqueror. The improvements in performance over Solution are astounding. Well done!" B.C.Papegaaij, Netherlands. "I am highly delighted with this new emulator. (Apart from the speed-up) it also appears to be more tolerant." L.Chandler, Peterborough. "Congratulations on bringing such a fast PC emulator into the world - on it, even Wordperfect runs at a reasonable speed." R.Williams, London. "I'm impressed with the improvement in speed over Solution." P.Vervoort, Netherlands. "Thank you for your prompt service. I have Conqueror up and running, and congratulate you on an excellent piece of software." G.Leagas, Hartlepool. "On some benchmarks almost as fast as a PC." P.Johnson, Stoke on Trent. "Conqueror is still a whole lot faster (even) without Lightning than Solution is with the assistance of Lightning." P.Christie, Glasgow, who went on to praise Conqueror for running software Solution couldn't handle. "Conqueror, to which I upgraded from Solution, is a delight to use by comparison!" B.Gouldwell, Dunipace..... V.Pakanen, Finland sums it all up rather well with - simply - "Excellent."

PROFESSIONAL PUBLISHER

To show you a little of what our **Professional Publisher** can do, we have prepared our last advertisement using it. Notice from our May 1990 advertisement how we can wrap the result around graphics or in fact anything, of any shape. When we wrote **Professional Publisher** (PP), we knew it was a very special sort of program. PP can produce pages of quality - virtually indistinguishable from those prepared on professional typesetting kit, the only limiting factor might be your printer: however, while the very best output output from PP will be obtained from 24 pin models and lasers, you will be stunned by what PP can squeeze out of the humblest 9-pin machine. Great care was taken in the design of PP so we were absolutely sure that no actual knowledge of, or practice with, desktop publishers was required in order to use it (the 'Professional' in 'Professional Publisher' refers to the output quality, not the level of operating skill required. When you use PP, you will notice that at each and every stage a menu is available (there are getting on for a hundred menus in total) with a list of options selected by using either the cursor keys and SPACE bar, or by pressing a digit key - use what suits you! experienced with the program, you may select Command mode (using the Enter key) and choose operations directly, bypassing the menu system. PP is more user-friendly than any page-making program we have ever seen on any computer, period.
Let us talk you through how you might choose to produce a page or succession of pages. This is just one way you might proceed: PP does not impose any sequence of steps upon you, and you can omit certain operations altogether. You will have pre-configured PP to boot up with a generous lot of fonts (you select which ones you are likely to want - of course you can load in additional ones, or discard existing ones, at run-time too). You could then set the required page dimensions and orientation, as well as not-necessarily-symmetric margin, grid, gutter, column and navigation-guide positions (yes, half the PP manual is a glossary) - you could have pre-configured PP for these too, or loaded in alternative layouts (layouts are distinct from page contents) you've created in previous sessions. If you don't set layout we'll use the default, or the one used for the previous page. Now you would plan the page in detail. Laying out graphics (if any) comes next - you can create these in PP itself, with its superb rubber-banding, dozens of brushes, palettes, texture-fills and so on. Alternatively, you can load in screens created elsewhere, including Eye-Q, Easel, any other graphics programs or digitiser, into a cut and paste buffer where a dozen tricks (including resizing, slanting, scrolling and texturing) are available, and then take the finished product onto the page. This done, you might insert headlines or captions, selecting from the dozens of fonts available. Each font can be manipulated in billions of ways (yes, we mean thousands of millions): to give but two examples, you have a choice of 32 slopes for italics for the font, and dozens of aspect ratios are selectable. Now you might opt to get the main body or bodies of text down on the page. As fonts are defined to great accuracy (upto 2304 pixels PER CHARACTER!) jaggedness is a thing of the past, and visually the choice of fonts can only be described as stunning! You can do this either by directly typing it into cursor-dragged boxes (with all the options you would expect from a dtp system, and a few more besides), or by loading it in from file created by Quill, **PERFECTION**, Editor or other word-processor. The latter method is better (because you retain the text as a character stream rather than as pixels when you save the file). Highlights such as bold, underline etc which you may have inserted into the text are preserved. Indeed, you can control PP's operation from within the text file itself. If you are an advanced user, you can even teach PP your own mnemonics, so that it switches between different styles and modes as it encounters instructions you put into your text file when you created it! The imported text file is editable within PP. It is up to you to decide where the text is to lie - PP places no restrictions on either the number or the shape of the windows into which the text is to flow: they need not be rectangular, and can have any irregular border, and can even overlap or be contained one inside another! You can freehand-draw (there's excellent rubber-banding to help you) the window borders as you choose, to get any effect you desire, to fill any space you wish and to avoid any existing material already on the page (or to reserve room for new material). Amazingly, within the window the text will all be perfectly micro-justified in the font(s) of your choice, however bent or contorted you made the border. Text will flow automatically from one window to the next either until you have run out of text or out of windows. There are many text formatting facilities: you can select word-wrapped, force-broken or hyphenated, and you can specify minimum numbers of "pre-hyphen" and "post-hyphen" characters so that absurd hyphenations are avoided (if no sensible hyphenation position can be found the word is wrapped instead). There are so many fine-tuning controls here that the rest of this ad could be devoted to describing them and would still leave things out! We will have to content ourselves with but one example: with micro-justification (pixel by pixel spacing, not crude character by character stuff) we even allow you to specify what % of padding space is to be allocated between characters and how much between words! Text work completed, you can then put in the final touches by adding borders, shadows, patterns or designs, overwriting or slipping under or combining these with existing material, repositioning parts of the page if necessary. The end result - be it for a letter, letterhead, document, manual, article, newsletter, magazine, book, thesis, ad - is far better than you have any right to expect from a piece of software costing under £2,500, let alone under £100...

PROFESSIONAL PUBLISHER TOOLBOX

NEW!

For Professional Publisher users - this useful addition not only supplies several man years worth of beautiful high definition fonts - including familiar types like Roman and Universal - but also contains many smaller fonts, more clipart and programs to load Sector Software clipart, filter text before importing into Professional Publisher, save parts of Professional Publisher pages as screens (for importing into any graphic program - like Eye-Q - or manipulating via SuperBASIC) etc. Excellent value.

FONT ENLARGER

For Professional Publisher users - loads of large fonts are automatically created by this multitasking utility, as and when you need them (or in advance), by enlarging existing smaller smaller fonts from PP itself and from Lightning Special Edition and hordes of other sources: with this there is NO jaggedness at all. A font editor for small and large (hdf) fonts is included.

GRAFIX

Scaleable output for all our desktop publishers on 9- and 24- pin printers: a useful alternative to the built-in drivers.

EYE-Q

There is no way to describe **Eye-Q** except as the best graphics program for the QL. This master is now four years old, and we have never felt the need to change anything. Its use is characterised by absolute simplicity, speed and power - it has that indefinable precision "feel" that is just right. All the expected manipulations are provided. Whether your needs are technical drawing, labelling, design, illustration, freehand work, copying - or just having fun, **Eye-Q** will not disappoint. Of course it is menu driven with context-sensitive help. The system takes 5 minutes to learn. The variable zoom and fill facilities, anti-fingerslip measures, cursor acceleration and so on make **Eye-Q** a classic in its own time.

ULTRAPRINT

To get the best printer output from Eye-Q or any other graphics program from any other source, **Ultraprint** delivers. An amazing 22 styles to choose from: enhance contrast (for line output) or gradation (for pictures) and vary magnification... A printer without **Ultraprint** is no printer at all.

MEDIA MANAGER SPECIAL EDITION
MEDIA MANAGER

MMSE is a joy to use. Whether something has gone wrong with a disk or tape ("Not found", "Not a valid Quill file", "Bad or changed medium", "Read/write failed" etc) or whether you want better control over your programs and data, **MMSE** should be to hand. Virtually any calamity can be recovered from automatically: all permutations (accidental deletion or part-overwriting, part-formatting, errors yielding: bad map but OK directory, bad

directory but OK map, bad map and directory, OK map and directory but bad file sectors, unknown fault, power glitch corruption and so on) have been carefully thought through and catered for. If nothing is wrong, but you just want to explore and understand more about your system, you can potter to your heart's content, assisted by the clear and packed-with-facts manual. Dozens of different diagnostic printouts can be produced. The whole system is menu-driven, with context-sensitive, on-screen help for every option. The speedy Sector Editor is a positive delight: the collector file facilities, bulk recovery, auto-navigation, skipping through the medium in physical, file (if map), logical (if no map) or uncollected/logical (if destroyed map, and because of "chequered" history with lots of overwriting/deletions no one-step recovery available) sequences must all be experienced to be believed. MASE is extremely simple to operate, and assumes no advance knowledge whatsoever.
Alternatively, if you wish to tidy up your disks or cartridges, MASE allows you to change volume format names, sort directories into alphabetic, date or size order, analyse file contents and histories, change case of filenames, move data/programs to/from alien-format disks, introduce or break copy-protection systems (illegal use prohibited!), MASE can and will deliver the goods. It is absolutely superb.
The standard **Media Manager** is much less powerful, and less easy to use. It is only for those on a tight budget.

TOOLKIT III WITH ROM
TOOLKIT III

Virtually everyone with a disk system has Tony Tebby's fine TK2 Supertoolkit on board (usually built into the disk interface). **Toolkit III** - which works whether or not you have TK2 - takes off where TK2 ended, adding about 70 new commands and enhancing many existing QL and TK2 commands. TK3 is for everyone with a QL. You can get this system on cartridge/disk, with or without a plug in ROM cartridge in addition. The documentation is complete and very comprehensive. Some of the added commands are:
ADIM * ADIMN * AND_L * ATYP * BASREF * BV_BASE * CHANNELS * CH_BASE * CINT * CLOSE% * DEVLINK * DIR_USE * DITS * DIV_L * EOR_L * EXTRAS * FACC * FLP_SEC * FLP_START * FLP_TRACK * FLP_USE * FRAC * ISFLT * ISINT * KEYS * LARRAY * LOWERS * MEMCOPY * MEMSWAP * MJOB * MJOB_W * MOD_L * NFS_USE * ODD * OM_INIT * ONPIPE * OR_L * PEEK_F * PEEKS * PEND * PIPE * POKE * POKE_F * PRED * QDOS$ * QIN * QOUT * QTEST * QWAIT * RAM_USE * REPLACE * REPLACE$ * RESET * RJOB_A * ROUND * SARRAY * SEARCH * SETDIR * SETDIR_A * SETHOST * SETNET * SETRO * SETRW * SETSYS * SETUSER * SGN * SORT * SORT_I * SUCC * TK3_EXT * UPPER$ * USER * WN_BASE * WSETHOST * WSETNET * WSETRO * WSETRW * WSETSYS * WSETUSER
Whether or not you can program, **Toolkit III** is of great use!

QFLICK CARD INDEX SYSTEM

Few users actually require all the facilities of a complicated database like Archive. **QFlick** presents a very convenient alternative - a very fast, simple to use card-file database, with easy to learn, snappy search and navigate commands and clean file-handling. You can move Archive data to/from **QFlick**. You can run multiple copies of **QFlick**. And **QFlick**'s data is organised so it is easy to program from SuperBASIC, even for tyros!

PERFECT POINTER TOOLS

This excellent program gives you an on-screen pointer (arrow) environment of incredible smoothness, and 6 utilities with it. To explore the world of QPtr, Things, Hotkeys, Window Manager....

QUICK MULTITASKING SYSTEM

A pull-down menu controlled multi-tasking front-end, ideal for running in the background and giving you notepads, file-handlers, quick backup, clock, diary, mini-database, calculator etc etc.

DISKTOOL WITH QUICKDISK

An exciting way to accelerate disk access by upto 30%, add password protection to disks and to optionally increase disk storage capacity by 36K to 1512 sectors! All this works while maintaining full compatibility and normal disk control...

DIGITAL C SPECIAL EDITION
DIGITAL C COMPILER

Superb C compilers these - fast in execution, they produce extremely speedy and concise code. No-nonsense documentation is included. The Special Edition has many more features, including pointers, long pointers, structures, >64K code sizes, direct access to traps and vectored utilities, and is twice as fast because of its more efficient C/QDOS libraries.

TURBO BASIC COMPILER + TOOLKIT

This state of the art system will automatically convert ordinary SuperBASIC programs - the sort you buy, write yourself or type-in from magazines - into machine code, the language of the 68008 CPU, the brain of the QL. Such pure machine code programs run "directly", without the need to be interpreted by any intermediary system. This direct execution makes them MUCH faster in execution than BASIC. **Turbo** also adds a host of useful high-speed commands (called "toolkit extensions" if you are fond of jargon). Here are some timings, all carried out on a JS Trumpcard QL, to give you a taste of just how much **Turbo** can improve things:

	Iterations	SuperBASIC	Turbo'd	Speedup
Empty FOR...END FOR Loop	30000	49 sec	1.3 sec	38x
Empty REPEAT Integer Loop	30000	151 sec	2.4 sec	63x
String concatenation	3000	448 sec	0.4 sec	110x
Search through memory	300000	1410 sec	1.5 sec	900x

Turbo's automatic conversion process, called compilation, is as simple as this: (1) Boot up with the **Turbo** disk (2) Load in or type in your BASIC program (3) Enter the word CHARGE, and watch the friendly front-end menu pop into view (4) Choose a filename for the machine code task that is to be generated and (5) Press the SPACE bar. **Turbo** does the rest! Compilation is a one-off process, and is very fast too - it takes little more time than LOADing the original program did! Once compilation is finished, you have a machine code version of the original program. Start this with EXEC, just as you used to invoke the original program with LRUN: besides the tremendous difference in running speed, you will notice that the program loading time is cut down to a few seconds at most (big SuperBASIC programs can take half an hour or more to load). The EXEC mechanism also allows you to multitask programs, something impossible with SuperBASIC, as well as manipulate their time-priorities, link them together, exchange data and even share parts of their code while executing.
If you are an advanced user, **Turbo**'s numerous fine-tuning facilities, 200-command toolkit (a terrific complement to the famous Supertoolkit) and 300+ page manual will be irresistable. If you are a beginner, you will wonder how you ever did without **Turbo**'s program diagnoses and auto-correction.
Turbo is more than a very clever optimising compiler. **Turbo** is magic. If you do not have it, you can have no conception of the experience you are missing and the power you are forfeiting.

SOLUTION WITH DR-DOS v5.0
SOLUTION

This program transforms your QL into a pretty compatible - albeit not fast - PC clone. **Solution** will run over 95% of the "big name" PC software you have read about, missing out only on programs that make illegal use of the PC's operating system. **Solution** works solely from software so you don't have to worry about ripping your QL to pieces to fit anything, or have anything hanging out of the back. Just boot up the **Solution** disk and you will be using a PC, which will then ask for a copy of DOS (any) (just as it would if you were using a "real" PC). End of story - you are now using a PC. There are very few restrictions: both mono and colour CGA graphics are supported. 479K is available for PC software on a 640K machine and 667K when using Trumpcard - more than you will get on a PC or XT! Speed can be increased by using Lightning Special Edition but in final analysis just can't compare with Conqueror's speed). Because your newly aquired PC is really a QL you can multitask two or three PC programs (try doing that on a "real" PC!). You can also run QL programs alongside PC programs (DON'T try that on a "real" PC!). Converting files (data in either direction) between QL and DOS is no problem and you can re-configure the QL keyboard if you wish.

PROFESSIONAL ASTROLOGER
PROFESSIONAL ASTRONOMER

Our use of the term "Professional" in the name of an application program does mean that the quality achieved will meet or surpass the highest professional standards for that application. The term does NOT mean that you have to have the knowledge of a professional in order to get the best out of the programs.
Astrologer teaches you astrology from scratch, and enables you to produce reams (if you are short of paper, you can choose exactly how much) of narrative printout giving a person's horoscope, personality delineation, year-to-year life overview, detailed day-to-day (in fact, minute-to-minute!) predictions, as well as two-person compatibility interpretations. Also provides all the technical readouts, charts and zodiacal wheels you would expect. It is extraordinarily fast (there is a great deal of very clever maths within it) and it performs the whole computation in under a second. The author of the manual is the author of this advert, so you can expect a lucid and humorous read! Whether or not you believe in astrology - indeed, especially if you do not - this program is one that you cannot afford not to have. Scores of detailed readouts for famous people are supplied, incidentally - very interesting reading they make too... Discover Mrs Thatcher's secret yearnings, explore yourself, play the Stock Exchange...
Astronomer is an extremely efficient solar system computer, with planetarium views, planet faces (with shadows/eclipses), five different co-ordinate systems, 1sec=1day cinerama, etc.
Astrologer + Astronomer is supplied at a very low combined price.

ACT SPECIAL EDITION

The **Adventure Creation Tool** is for every programmer or putative programmer. Whether or not you have any interest in adventures, you will find something useful here. Animated graphics, data compression, language design and parsing, maps, object-oriented control and much more, with an excellent educational manual too.

3-D PRECISION CAD SYSTEM

2-D and 3-D design and manipulation, at a speed sufficient to permit real-time animation! Whether or not your interest is serious, 3DP will change the way you look at the world around us. The variation of viewpoint, perspective and magnification is very smoothIn addition to dot-matrix output, plotters are catered for.

SUCCESS

Run CP/M programs on your QL! What more is there to say, other than that after the PC family, no more common system exists than CP/M, with thousand of cheap programs... And **Success** is fast!

THE EDITOR SPECIAL EDITION
THE EDITOR

If your needs are for a technical Editor, or for full access to the entire ASCII character set (to handle machine code or compressed data files), or if your budget cannot stretch to **PERFECTION**, then this is the program for you. Editor is command-line driven and programmable. The Special Edition version is certainly better than the standard version: that is because the standard one contains only as many features as we could get to fit into an unexpanded QL. Both are fast and flexible, and very powerful indeed in the hands of the intelligent. Not a word processor, Editor's a way of life.

SPECIAL DESKTOP PUBLISHER
DESKTOP PUBLISHER

Both these WYSIWYG ("What You See Is What You Get" dtp systems are excellent in their own rights - it is only when you compare them with the stunning Professional Publisher that you become aware of their shortcomings. You won't get fonts as large or smooth as with PP, or wrap-around graphics, or as sophisticated a printer driver or text/graphics file import facility. You will get a very workmanlike tool, capable of producing output that the computer press described as fantastic and superb... The standard edition is the ideal if you do not have a disk drive: if you do have one, go for the Special version, which correspondingly has more features including textures, large windows, better drawing and improved command entry. All upgrades are possible, and there is only a £10 penalty for doing it in two stages. So if you simply cannot afford PP, one of this pair is certainly for you.

SUPERFORTH COMPILER WITH REVERSI

Why not learn FORTH, the most logical computer language of all? This superb FORTH-83 compiler produces stand-alone multi-tasking code of speed comparable to C. **SUPERFORTH** source is even portable to other machines! The manual teaches you the language.

IDIS SPECIAL EDITION
IDIS

Machine code (from other people's programs, toolkits and the ROM) is unintelligible until you put it through IDIS, the intelligent disassembler. IDIS Special Edition automates everything it possibly can, and requires no human intervention. It even sorts out subroutines, replaces addresses with names, untangles data from code and so on. Standard IDIS contains as much as we could pack into an unexpanded machine, and is nearly as automatic.
If you want to find out how computers work, buy one of these two!

MICROBRIDGE

Never be short of a four for Bridge again. Superb bidding tutor included, based on random hands dealt with lightning speed. Manual a masterpiece. Understands and obeys ACOL and much more.

SUPERCHARGE SPECIAL EDITION

If you have an unexpanded QL, or cannot afford Turbo, but want SuperBASIC programs to go faster, **Supercharge** is the answer. It has about half the speed of its big brother, is not as tolerant of badly-written programs, and lacks many of Turbo's features (like linking, program sizes >64K etc): nonetheless, it is the compiler about which we recieved over ONE HUNDRED happy letters from satisified users all using the word "Excellent" to describe it - and hundreds more who used other equally complimentary terms. The only gripe was about the Lenslok copy-protection, long since removed by us. So now **Supercharge** is wonderful....

SUPER SPRITE GENERATOR

SSG moves things about the screen rapidly, at machine code speed, directly from simple SuperBASIC. Any number of sprites (each with upto 16 frames for smooth realistic motion), 256 speeds, 256 planes, collision detection and dozens of special effects.

SUPER ASTROLOGER

A cut-down version of the Professional Astrologer - smaller horoscopes and manual, no interpretations for forecasting or compatibility testing. A marvellous buy at the price!

BETTER BASIC EXPERT SYSTEM

SuperBASIC is a super BASIC. If you want to improve your programs automatically, and learn as you do this, get **Better Basic**.

TRANSFER UTILITY

Copies files between devices, performing translates as it goes. Needs a ramdisk to run. Can move your microdrive material onto disk, so programs run from disk but you still have access to microdrives.

MONITOR

Check dynamic operation of programs - IDIS's ideal companion.

TERMS AND CONDITIONS)

* Our non-game programs are very comprehensively documented with A4 manuals averaging about seventy pages in length (the largest is 325+). They are 4-hole punched for easy binding and storage.
* UK purchasers - the quoted figures are all-inclusive. For the rest of Europe, add 5% (rest of the world, 10%) to the quoted figures to arrive at the VAT-free total (exports are zero-rated for UK VAT), inclusive of all freight and documentation charges.
* Acceptable forms of payment are sterling cheque drawn on a UK branch of a bank or building society, sterling postal order, Eurocheque made out in sterling, international money order in sterling, VISA/ACCESS/EUROCARD/MASTERCARD (specify expiry date), foreign currency cheque (add 10% conversion charge), cash, direct funds transfer (notify us in writing, and ensure that all charges are paid your end, or add 5%) to A/C 50327808 DIGITAL PRECISION LTD at Barclays Bank PLC (Branch code 20-79-44), South Chingford Branch, 260-262 Chingford Mount Rd, London E4 8JN.
* To upgrade from one version of a program to a superior program, send us the cartridge/disk. Except in the case of upgrades between program versions both with the same name, send the manual too. The cost of an upgrade is £10 plus the difference in current advertised price between the two programs. So the upgrade from DIGITAL C to SPECIAL EDITION DIGITAL C costs £30, and you would need to return the old manual as the program names are different. PERFECTION is not an upgrade to EDITOR, but SE EDITOR owners are allowed to claim a £5 reduction when ordering PERFECTION.
* Our programs are all user-transferable between cartridge and disk, are all free from ALL copy protection, and all work with all drives, toolkits, RAM add-ons and disk interfaces (except for early MCS interfaces, to which the emulators and media managers object). Users of the Microperipherals interface are recommended to buy the QFLP ROM upgrade from Care. ST/QL Emulator owners will benefit from a c2.7x speed increase on our software.
* All trademarks used or referred to in this ad are acknowledged.
* If you want Eye-Q, but want to use it with a Gigamouse, with QRAM or on a THOR, specify your intended use with your order.
* We supply unused cartridges @£3.50 each, £30/10 or £55/20.
* Digital Precision supplies quality hardware too - write/phone.
* Digital Precision (abbreviated by our admirers to DP!) is a trading name of DIGITAL PRECISION LIMITED, Company Registration No. 1833989, registered in England & Wales, VAT Reg. 420 1560 08.

PRICE LIST

PC CONQUEROR WITH DR-DOS V5.0	169.95	eT
PERFECTION PLUS WITH SPELL CHECKER	119.95	dT
THE SOLUTION WITH DR-DOS V5.0	119.95	eT
PC CONQUEROR	89.95	eT
PROFESSIONAL PUBLISHER	89.95	cT
PERFECTION	79.95	dT
TURBO BASIC COMPILER + TOOLKIT	79.95	aT
PROFESSIONAL ASTROLOGER WITH ASTRONOMER	69.95	aT
PROFESSIONAL ASTROLOGER	59.95	aT
LIGHTNING SPECIAL EDITION	49.95	+aT
DIGITAL C SPECIAL EDITION	49.95	aT
MEDIA MANAGER SPECIAL EDITION	49.95	dT
3-D PRECISION CAD SYSTEM	49.95	dT
SUCCESS	49.95	bT
THE EDITOR SPECIAL EDITION	49.95	dT
ACT SPECIAL EDITION	49.95	eT
TOOLKIT III WITH ROM	44.95	+a
IDIS SPECIAL EDITION	39.95	dT
EYE-Q	39.95	aT
THE SOLUTION	39.95	eT
SPECIAL DESKTOP PUBLISHER	39.95	ct
SUPERFORTH COMPILER WITH REVERSI	39.95	aT
MICROBRIDGE	34.95	d
PROFESSIONAL PUBLISHER TOOLBOX	29.95	eT
TOOLKIT III	29.95	a
QFLICK CARD INDEX SYSTEM	29.95	a
PERFECT POINTER TOOLS	29.95	a
SUPER SPRITE GENERATOR	29.95	a
SUPERCHARGE SPECIAL EDITION	29.95	a
PROFESSIONAL ASTRONOMER	29.95	fT
THE EDITOR	29.95	at
DIGITAL C COMPILER	29.95	at
GAMES COMPENDIUM (ALL FIVE GAMES)	29.95	a
QKICK MULTITASKING SYSTEM	24.95	a
IDIS INTELLIGENT DISASSEMBLER	24.95	at
LIGHTNING	24.95	aT
SUPER ASTROLOGER	24.95	f
DESKTOP PUBLISHER	24.95	d
MEDIA MANAGER	24.95	a
BETTER BASIC EXPERT SYSTEM	24.95	aT
FONT ENLARGER	19.95	eT
DISKTOOL WITH QUICKDISK	19.95	b
ULTRAPRINT	19.95	aT
MONITOR	19.95	aT
TRANSFER UTILITY	9.95	b
GRAFIX	9.95	eT
SUPER BACKGAMMON GAME	9.95	f
REVERSI GAME	9.95	f
ARCADIA GAME	9.95	f
BLOCKLANDS GAME	9.95	f
DROIDZONE GAME	9.95	f

KEY

! As well as a cartridge or disk, you get a ROM +
! Available either on cartridge or disk a
! Available only on disk b
! Minimum 512K RAM:only available on disk c
! Minimum 256K RAM:either cartridge or disk d
! Minimum 256K RAM:only available on disk e
! Available only on cartridge f
! Compatible with THORs including the THOR XVI T
! Compatible with all THORs except the THOR XVI t

LIMITED PERIOD: SPECIAL DEALS ON OUR PROGRAMS

****

* Buy ANY *TWO* programs, get 10% off the total price!
* Buy ANY *THREE* programs, get 15% off the total price!
* Buy ANY *FOUR* programs, get 20% off the total price!
* Or buy *FIVE* or more to get 25% off the total price!

****

UPGRADES COUNT AS PROGRAMS FOR COMPUTING SPECIAL DEALS
DR-DOS (NOT BEING OUR PROGRAM) MUST NOT BE COUNTED

USER VERDICT

	Poor	Moderate	Good	Excellent
Installation				▲
Ease of use				▲
MS-DOS compatibility				▲
Use of PC's features				▲
Functionality				▲
Documentation				▲
Tutorial			Yes	
Value for money				▲

IN PC USER VERDICT This is the first time I've given my product an all 'excellent' verdict, which speaks for itself. ● PRODUCT DR-DOS 5

DR DOS 5.0

Digital Research
WE MAKE COMPUTERS WORK

OPERATING SYSTEM
for PCs and
PC Conqueror

*We can now supply the amazing new **DR-DOS v5.0**, normally sold for £119.95+VAT+P&P = £144, for **£80 all inclusive** (when bought with Conqueror/Solution,or by MSDOS users (who can at the same time send in the old Conq/Sol disk for a free upgrade) - else £90)! This best DOS has 600+ page manuals ViewMAX,Cache, online Help,screen Editor, command-line History, passwords, FileLINK +MemoryMAX, Ramdisk, 71 DOS files(1.4Mb), top compatibility & DR technical support. Our v5.0 is the **22/1/1991 NEWEST**, updated release. The PC press have raved about it and PC Plus (see left) gave it seven (7!) excellent grades. So get **DR-DOS v5.0 NOW!**

To: DIGITAL PRECISION LTD
222 THE AVENUE, LONDON E4 9SE

ORDER COUPON

Or telephone
081-527 5493

Please send me: _____
Name: _____ Address: _____
_____ Postcode: _____
Enclosed: CHEQUE/PO/CASH/VISA/MASTERCARD/ACCESS/EUROCARD for £_____ Signature: _____
Card No: _____ Expiry: _____
I use: (QL/THOR) (MDV/3.5" DISK/5.25" DISK) (360/720/1440 SECTORS)

DIGITAL PRECISION LTD

PSION ORGANISER

LZ64	£180	Using Psion Organiser	£10
Psion LX Book	£15	Spelling Checker	£30
Comms Link	£60	Organiser XP2 32K	£110
32K D Rampack	£55	Numbase 1	£40
Centronics Interface	£40	Psion Printer	£230
Organiser LZ	£150	File Handling Book	£15
128k Datapak	£100	32K Datapak	£35

Z 88

ZBase	£69.00	Easy Money	£69.00
Spellmaster	£59.00	Z88 Computer	£230.00
Thinkz	£50.00	Z-Term	£50.00
Cambridge Topper	£8.00	Superchip 4	£150.00
Centronics interface	£30.00	128K Eprom	£50.00
128K RAM Pack	£50.00	Z-Tape	£50.00

TK COMPUTERWARE

the QL stockist

Tel: 0303-81-2801

HARDWARE

768K Trump Card	£225.00
256K Trump Card	£135.00
768K Trump Card and Dual 3.5" Disk Dirves	£375.00
256K Trump Card and Dual 3.5" Disk Drive	£285.00
256K Trump Card and Single 3.5" Disc Drive	£210.00
Disk Card	£100.00

SPARES

JS ROM SETS	£30.00
Keyboard Membrane	£8.25
ULA ZX8302	£10.25
ZX 8301	£12.00
MAB 8049	£7.50
MP 68008	£20.00
Z9007E	£10.25
Repairs	phone
M/drive assemblies-complete	£27.50
Voltage regulator (high output)	£4.75
Power supply UK	£28.50
QL Test kit	£13.50
M/drive assemblies (xchange)	£20.00

BOOKS

Z88 Dabhand Guide	£16.00
Assembly Language Prog	£9
Z88 Ref Manual	£16
Z88 Magic	£16
Z88 Pipe dream	£16
Using Your Z88	£10
Z88 Computing	£10
Z88 Software DLV Guide	£40
QDOS Companion	£9

SOFTWARE

BUSINESS

Perfection	£80.00
Perfection plus	£120.00
Cash Trader (PDQL)	£40.00
Decision Maker	£35.00
Stock Accounting System	£40.00
Sales Invoicer	£20.00
Home Finance (Buzz)	£22.00
Investment Monitor	£20.00
Project Planner	£29.00
Small Traders Pack	£25.00
Touch Typist	£12.00
QYTP	£23.00
QYTP 2	£30.00
QPAC II	£50.00

UTILITIES

Chocolate Emulator	£90.00
Archivist MP	£40.00
Archivist	£30.00
Cartridge Doctor	£18.00
Expert System	£50.00
Page Designer 2	£35.00
Professional Publisher	£90.00
Master Spy	£30.00
ArchRTM+ArchDEV	£20.00
ICE Eprom	£27.00
Locksmith	£15.00
Mailfile (256K)	£20.00
Archive Tutor	£20.00
QFLASH Ramdisc + t'kit	£19.00
QFLASH Ram Eprom	£25.00
QFLASH Ram utilites (c-d)	£10.00
Reconfigurable toolkit 2	£29.00
4 Matter	£15.00
Recover	£20.00
Turbo Quill Plus	£13.50
Media Manager Special Edn	£50.00
Super Media Manager	£30.00
Sidewinder Deluxe	£20.00
Conqueror	£90.00
Media Manager (d)	£20.00
XRef 2.00	£20.00
Super Toolkit 2 (Eprom)	£29.00
Disc Over	£30.00
Success	£50.00
RPM	£15.00
Task Master (c-d)	£25.00
The Editor	£20.00
The Editor special edition	£49.00
Turbo (c-d)	£80.00
Vanilla Emulator	£40.00
Ultra Print	£20.00
SPY	£15.00
Lightning	£30.00
Quailsoft Terminal	£30.00
Lightning S.Edition	£50.00

CAD

Graphic QL Plus	£25.00
Eye Q	£40.00
3D Precision	£49.95
Technikit	£25.00
TechniQL	£50.00
3-D Designer	£38.00
PCB 1	£99.00
PCB 2	£50.00

LANGUAGES

Assembler Workbench	£25.00
Forth (Computer One)	£30.00
Better Basic	£24.00
BCPL Development Kit	£51.00
Digital C	£30.00
Digital C Special Edition	£50.00
MonQL	£30.00
Pro-Fortran-77	£99.00
Pro Pascal	£99.00
QMON	£20.00
Super Forth + Reversl	£39.00
IDIS	£25.00
IDIS Special Edition	£35.00
GST Macro Assembler	£38.00

LEISURE

Chess	£19.00
Super Croupier	£13.00
Flight Simulator	£19.00
Matchpoint	£15.00
Bridge Player 2	£15.00
Prof Astrologer Astronomer	£70.00
Super Astrologer	£25.00
Crown of Sorkingnm	£17.50
Snooker	£13.00
Super Backgammon 3	£13.00
War in the East (set)	£39.95
Microbridge	£35.00
Heart of Gem	£15.50
Area Radar Controller	£13.00
Talisman	£19.00
The Prawn	£15.00
Blocklands	£10.00
Archanoid	£15.00
Death Strike	£15.00
Fictionary	£11.50
Firebirds	£13.00
Karate	£15.00
Mortville Manor	£15.00
Vroom	£13.00
Stone Raider	£13.00
Lands of Havoc	£19.00
Shang	£15.00
Aquanaught	£19.00
King	£13.00
Stone Raider	£15.00
Brain Smasher	£18.00
Patience	£18.00

• Please telephone for details of other products not listed here •

SUNDRIES

VDU cleaning kit	£7.50	Joystick + adaptor	£18.00
10 Microdrive cartridges	£26.00	Psion 2.35 Sets	£26.00
100 Microdrive labels	£3.75	QL-Z88 Link	£25.00
Mains filter	£24.00	10 3.5" Discs (unbranded)	£12.00
10 DS/DD discs 3.5" (brand)	£26.00	QL Dustcover	£6.00

PERIPHERALS

Keyboard 90 Interface	£75.00
QL Scanner	£140.00
Centronics Interface	£29.00
TAN Data QCom set complete	£75.00

ALL PRICES INCLUDE VAT. U.K. POSTAGE £2.50 PER ORDER. - WE EXPORT WORLDWIDE
Phone for details of other QL products OR send SAE for our latest catalogue.
Credit card phone orders accepted, or send cheques, postal orders, Eurocheques, to:

TK COMPUTERWARE, STONE STREET,
NORTH STANFORD, ASHFORD, KENT TN25 6DF

TELEX
966676 PMFAB G

VISA · Access · MasterCard · AMERICAN EXPRESS · EUROCARD

FAX
0303 812892

QL SCENE

New Q–Liberator

Liberation Software have released *Q_Liberator* V3,3, announcing the new version of the SuperBasic compiler as fully *Minerva*-compatible and bundled with *Qload* and *QRef* for the inclusive price of £50.

Q–Liberator is now described as fully compatible with all versions of the Minerva rom, and supporting all the SuperBasic enhancements within Minerva. It allows compilation of programs using the dual screen mode, and also works with multiple Basic interpreters, making full use of the Minerva rom's fast arithmetic and graphics routines. Integer tokenisation is fully supported, and allows Q_Liberator to produced faster and more efficient code.

"Keeping up with the rapid evolution of Minerva wasn't easy, but we have worked closely with QView to ensure that our users have no compatibility problems," says Q_Lib co-designer Ian Stuart,

A major enhancement in V3,3 is compiler support for the WHEN ERRor and WHEN VARIABLE constructs. A JS or later QL rom is needed to compile programs using WHEN, but Q_Lib will produce compiled programs which will run correctly on any QL. Other features include improved error reporting, and the ability to call procedures which run as standalone jobs. Default directories and compiler options can now be customised with the standard QJump config program. Q_Liberator is specifically capable of compiling programs which use the Tony Tebby pointer environment.

Other Liberation software includes QLoad, which significantly reduces SuperBasic loading times, and Resident Program Manager, which simplifies the placing of program code into rom. Both are also Minerva-compatible.

QLib 3,3 costs £50. The upgrade price for 3,2 users to return their masters is £10, and for earlier (non-budget) versions £15, including a complete new manual. Budget Q-Lib owners can upgrade to the full specification compiler for £30.

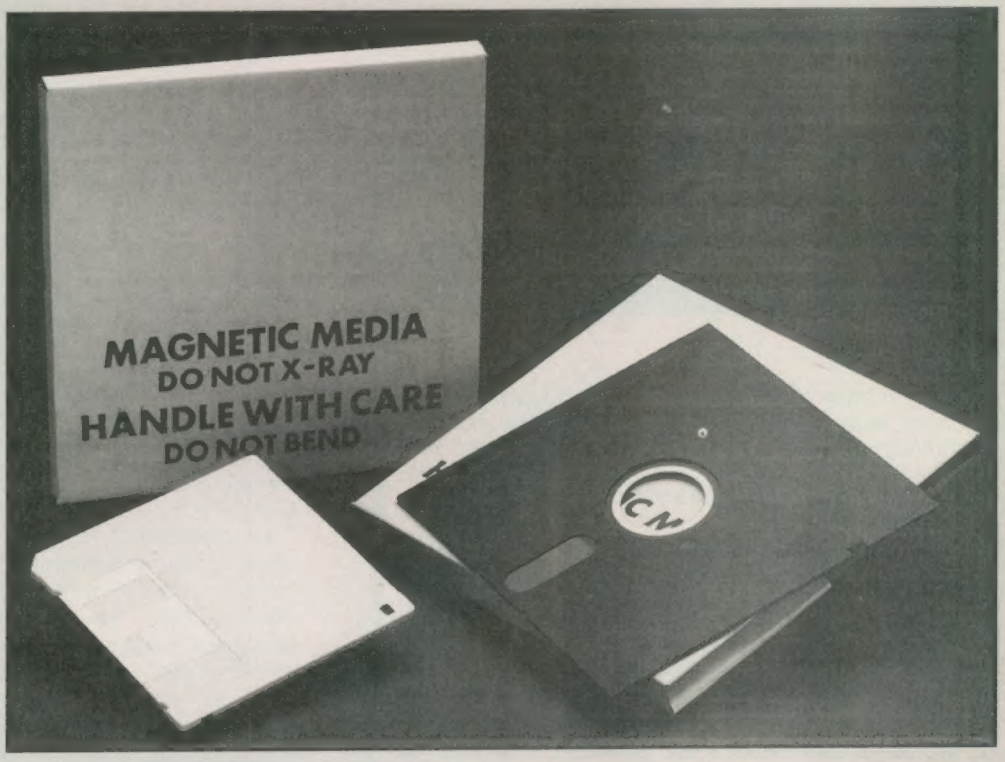
Enquiries and orders to **Liberation Software, 43 Clifton Road, Kingston upon Thames, Surrey KT2 6PJ. Tel. 081 546 7795.**

Fair in Brum

The All Formats Computer Fair comes to the Birmingham area this month. The first regional All Formats fair is set to appear at the National Motorcycle Museum, Coventry Road, Solihull on Sunday 21 April. The fair will be run as usual from 10am to 4pm.

The National Motorcycle Museum is a well-known local venue and is conveniently sited just the other side of the Coventry Road (Solihull bypass) from the vast National Exhibition Centre complex, just off junction 6 of the M42. The site is several miles outside Solihull town centre and further still from central Birmingham, so rail (and air) travellers should go to Birmingham International (NEC); road users should follow signs to the NEC until they locate the tiled roofs of the Motorcycle museum on the other side of one of the main access roundabouts to the NEC, The Motorcycle Museum has its own car park.

Entrance as usual is £3 on the door or in advance from **Mike Hayes, 8 Midgrove, Delph, Oldham OL3 5EJ** (cheques payable to JRMH) or **John Riding 0225 868100,** Stands from £75.



Swan Disk Packs of Corby are in their tenth year of postal pack production, and would like us to know that they are now producing

a mini-disk pack for 1991. A rigid construction offers ideal protection, and the unique design ensures easy assembly in seconds: now available in three standard sizes, 6 by 6 in, 8.75 by 8.75 in and Mini Disk. Mini disk is of little assistance to QL users, but disk owners might like reminding that cardboard postal packs will keep your disks crisp and flat, your disk envelopes crumple-free and smartly creased along the edges, as befits a true product of Corby. They represent a major advance on stapling disks to the covering letter. From good computer suppliers and stationers everywhere. Bulk enquiries to **Swan Packaging Ltd., Unit 6, Princewood Rd., Earlestree Industrial Estate, Corby, Northants NN17 2AP**

OPEN CHANNEL

Open Channel is where you have the opportunity to voice your opinions in *Sinclair QL World*. Whether you want to ask for help with a technical problem, provide somebody with the answer, or just sound off about something which bothers you, write to: Open Channel, Sinclair QL World, 116/120 Goswell Road, London EC1V 7QD.

Tell us more . . .

Hmmm. . . What's this? A Miracle Systems 68020 prototype board? Tell me more! Please!

By the way, take as read all the usual compliments about the magazine. It really is a boon to us QL addicts out there.

Andrew Towler
Nottingham

Editor's comment: We'll tell you. . . as soon as we know. Miracle, bless 'em, play their cards close to their chest. Better than loosing off prematurely – that's probably why they're still here after all these years.

Upgrade!

Some years ago I purchased a Sandy Superdisk V1.00 16AG, 1984, with a single disk drive. This I found most reliable, but I now wish to add a second disk to use *Perfection Plus*. As I have limited finances, could you please advise me if a dual drive would plug into my existing memory expansion and if the size of that memory is adequate to cope with such a new program.

DO Topp
Scaynes Hill
Sussex

Editor's comment: once again this is the kind of question best answered by someone who is currently using the Sandy drive for the type of purpose Mr. Topp envisages, and we would be pleased to hear from anyone with the answer. Has he followed our usual advice and had a word with DP first? Software publishers cannot always answer this kind of specialised, hardware-related question but they are a good place to start.

Editor's notebook

People have remarked that Freddy Vaccha has not been seen around town for the last few months. Freddy, it seems, has been squirreled away with Steve Sutton, finishing Digital Precision's long-awaited, much-discussed sockbuster wordprocessor, *Perfection.*

Now we have the first look at Perfection as it came hot off the press. No doubt there will be more, much more to come, but on first encounter, Perfection seems to be living up to it stated aim of being like Quill with far wider horizons.

Local contributor David Drysdale has contacted QL World to inform us that David Batty of Sector Software has apparently orgaised his next show - which will be an all-formats show – for Saturday 27th April at Runshaw College, Leyland, Lancashire. The previous show venue is no longer available. More information from David Batty on 0772 454328.

As I write, I am being offered information about the new Miracle Systems expansion board; the word is that this may indeed be the faster and better QL. More next month.

Buried

Is there anyone who could help me? I bought my JM QL in 1985 and have been using it continually ever since. When I bought my QL it came with V2.0 of the Psion suite and another cartridge titled The Games Cartridge. On it were several games *(Zfred, Pirate, Breakout, Gun and Treasure)*. The latter is a SuperBasic adventure by Halvor Heuch, Unfortunately I have never been able to get it working, because the microcassette was corrupt from the time I got it. This only affected Treasure, and no amount of hacking into the cartridge with Talent *Cartridge Doctor* or hex/Ascii dumping to the printer has found the lost sectors.

Is there anybody who has a working copy of Treasure who would be kind enough to either give me a copy of the listing, or a copy on microdrive or 3.25in disk (either returnable), to save me from the frustration of having an almost working copy of what looks like a good text adventure?

Terry McKnight
Salford
Manchester

MODE16?

This letter is an idea for DIY Toolkit section which will enhance the QL graphics. In 256 x 256 resolution mode8, it is possible to have a full eight colour palette, but in 512 x 256 mode4 it is only possible to have four colours. I was wondering if it would be possible to have a command such as MODE16, which would enable a full eight colour palette, but I should think this would take up 64K of memory. However, most people have a memory expansion of some sort and, if not, for any programs needing a full 128K, the mode could be switched back to four or eight.

If this is not possible, then a follow up on the LINE and PLOT commands featured in DIY Toolkit would be useful. This could include a 'circle' and 'arc' command, which works with the pixel co-ordinate system as well. Also a full function which works with these commands as the present full command does not.

Simon Walker
Evesham
Worcs

Rodime

Reading *QL World* March 1991 I saw Edward Jones' request for the address of Rodime Plc. Rodime's phone number is 0592 774704, asking for the technical department. I used this number myself about a year ago, so they should still be there. *(They are, and the address is Rodime Europe Plc, Nasmyth Road, South Field Industrial Estate, Glenrothes KY6 2SD.)*

A useful tip for readers who have difficulty obtaining phone numbers is to contact the various customer service offices by phone at major post offices. I have tried this method when BT's directory enquiries cannot help.

D J Brown
Whitmore Park
Coventry

Thanks

This letter is not a letter of complaint, although it may sound like one in parts, but is instead one of the thanks to everyone concerned, for helping my QL get onto its little plastic feet again, and finding the solution to a rare, if not unique, problem.

I recently bought the latest Trump Card 768K package from Miracle Systems, partly due to the microdrive cartridge supply problems and partly due to a bit of good luck involving football! I had read good reviews of the interface, and was in any case becoming annoyed that every Quill document was limited to about 1100 words before mdv2_ began to operate almost constantly.

Imagine, then, my dismay upon plugging the Trump Card into my D15 JS rom QL, connecting the power and being presented with a totally locked-up machine, with no sign of a memory test and certainly no "F1...F2..." starting screen. As I have had over four years of reliable, unexpanded computing, eventually with just about every port except the main expansion socket connected, I suspected a fault had occurred on the interface and sent it back to Miracle for attention.

They were very quick in returning the board to me with a note stating that it was in perfect working order and the fault must be in my computer. They recommended that I contact TF Services about the problem, and said that if a solution was not found then a full refund would be given.

Tony Firshman of TF Services suggested that I try other power supply units and interfaces with my QL before sending it to him. He also suggested that I remove the Q-Power regulator which I had fitted in September 1988. His reason for this was that the earlier version has been know to give rise to Bad or Changed Medium messages, especially from mdv2.

I followed this advice and with the help of Mr. Arthur Nunn, one of two users I know in this area, I tested my psu, QL and Trump Card with his machines. This revealed that the fault did indeed lie in my trusty QL, so off it went to TF for repair.

Within a week, it was back with me in a fully cured and expandable state. The problem had nothing to do with the edge connector, a dry solder joint or cut pcb track, but instead with the 68008 cpu. The remedy was to swap the original chip for one with gold plated pins to give better connections. As well as this, the microdrive units were swapped over, which stopped #2 playing up occasionally. The repairs are covered by a six-month guarantee and the bill came to £25. With service like that I hope TF Services is busy for many years to come.

Ian Thompson
Ripon
N. Yorks

Underline

When using some microdrives with Quill, I find that the command load, device? mdv2- 'results in a screen list which has each entry underlined. When this occurs, loaded documents also appear on the screen with all the text underlined: any fresh material inserted in the document is similarly underlined, and a new document added to the mdv is underlined on the screen in the same fashion.

Fortunately, when printed out, the text is normal, but working with the screen text underlined is not easy on the eyes. Crashing the QL, reloading Quill, and commanding a named document or creating a new one (without invoking the 'Load, device? mdv–' procedure), cures the screen problem.

Have others experienced this phenomenon, and can anyone explain it?

Beryl Crawley
Welwyn Garden City
Herts

More C

May I say how satisfying it is to see that *QL World* acknowledges the existence of the C programming language.

If I could be allowed a few suggestions I think Mr. Wright would acknowledge that his articles, good as they are, cannot really be anything but a way of interesting people in this magnificent language, and that there is nothing like a good textbook to actually teach it. Incidentally, I can thoroughly recommended *The C Programming Tutor* by Westman and Sidebottom, published by Prentice/Hall International. Even I can understand it, and it's cheaper than most.

My suggestions for subsequent articles would be:

(a) helping self-taught programmers like myself to write better, or more concise and subtle, code – something along the lines of DIY Toolkit, or Super Basic.

(B) to take one or two readers' queries each month and answer and develop them. When you are a self-taught amateur, there are dozens of questions and queries that inevitably go unanswered, however many textbooks you may read.

GF Fisher
Knowle
Bristol

Small C

My letter in *Open Channel* in February 1991 must have been quite old, as I have become a second year student going for industrial placement. I like the *Programming in C* series. As you may know, the Digital Precision C-compilers, of which I bought a Special Edition one many years ago, are in fact small-C compilers.

Small-C is a subset of C as specified by Kernighan and Ritchie, and doesn't provide things like multi-dimensional arrays, structures or floating point expression parsing. Although these features are not necessary for small applications, writing larger programs which use graphics or attempt to set up databases is almost impossible without these features.

My question is – will Digital Precision develop the existing small_C compilers to provide a full-blown K&R implementation of the C language? This should not be difficult, since the author of digital C obviously has shown his excellent abilities in compiler writing, and the Digital C compilers were written in 'compiled small-C'.

I reckon that when a full implementation of C is made available for the QL, programs written in C on other machines will instantly compile for the QL, making tonnes of new programs available. Also, more authors will be attracted to the QL.

My correspondence address was slightly wrong in February. It is 45 Marlborough Close, Grays, Essex, and my email address is cs89ssg@uk.ac.brunel.cct.

Sunil Gupta
Grays
Essex

Editor's comment: yes, your letter was one of a batch that was overlooked when we moved the magazine away from Greencoat House. When they turned up I decided to run most of them with small changes, and hope the authors had followed our progress. Clearly they have.

Freddie Vachha of Digital Precision writes: The key words are 'many years ago'. As we announced in our ads over a year ago, we've added many of the features he stated were desirable. The current version of Digital C Special Edition does support structures and floating point – an upgrade from the earlier versions costs £10 (return the original disk to us). Our implementation is now far in excess of the Small-C standard, and is not that distant from the full K&R standard; indeed, most of the small number of K&R features that Digital C lacks are either insignificant, or undesirable in terms of good programming practice, or both! Digital C Special Edition is very, very fast, and 'self-compiled' (proof of great flexibility).

The point about multi-dimensional arrays is an example of an insignificant feature: to use an analogy with SuperBasic, DIM A (m,n) is equivalent to DIM B(K) where k=m*n. There are one-to-one correspondences between the elements of the two-dimensional array A and those of the single-dimensional B; one example is given by A(x,y)=B(n*x-1)+y). The logic can be extended to any number of dimensions.

One last point; many people confuse the K&R standard with Lattice C. We can't do a Lattice C compiler, because the Lattice C is copyright material.

TROUBLE

A PROBLE

Bryan Davies sorts out the long letters from the short ones

Some letters we get cannot be dealt with in a couple of lines here. There was the nearly-8,000 words letter from Gerard Phelan, and now there are 19 pages (I'm not counting the words) from Orjan Larsson, of Karlskoga in Sweden. This month, I'll try to comment on some of the points raised by them.

Phelan was prompted to write by comments made in *QL World* about the *Minerva* Qdos-replacement rom from QView. He felt that our comments were something of a smear. In fact, regular contributors to QL World do take notice of input from readers (and others on the QL scene); it makes sense to do so, since we are paid to keep people interested in the QL. Had we not (separately) received letters and calls of complaint, we would not have commented on Minerva. The letters detailing software problems that have arisen after Qdos roms were replaced by Minerva ones continue to come in. Maybe the publicity will focus sufficient attention on the problems that have been created to get most of them sorted out.

Miracle

There were several other subjects in Phelan's letter. One was the Miracle hard disk, and its commands. Seeing bulletin board notes from several users, I initially hoped that there might be something there that would guide me in setting up the friend's hard disk which has lain on my workbench for several months, but that hope was soon dashed. Perhaps a recap of my problem here will bring comment from users who are familiar with the MS-DOS sub-directory structure. Users who know only Qdos are unlikely to appreciate the problem, as they will not have been much interested in the subject; it is a thing which comes up when you have mass-storage devices, such as hard disk.

Put simply, what I would like to do is set up a sub-directory structure on the QL hard disk which is essentially similar to that on the PC/AT. There is nothing magical, or exclusive, to the MS-DOS directories. You start at the top (or bottom, if you think in terms of a tree) with the *root directory*. This is where every saved file will go if no instruction is given to send it anywhere else. Your QL disk and cartridge files are normally stored in the root directory of the particular medium that was in the drive when the save command was issued.

As you get more files, in more categories, you begin to realise that you cannot keep track of them; files cannot always be related to a particular program or data subject by examining the file names. For example, it is fairly easy to recognise program files that are connected with *The Editor* – Edt_bin, Edt_charset, Edt_hlp have an obvious character-string in common.

But what about the data files associated with the same program? Do you put an extension on all of them (since the program does not)? If yes, do you use _TXT, for instance? That would be a way of identifying data files created with this program, although it might not be the best choice since _TXT is an obvious extension for Ascii files in general – that is, ones that are pure-text, and might be created by an Export command from various programs. No great problem so far, but what if (like me) you use *text*[87], *FlashBack, Perfection, Q_Switch, The Editor, Abacus, Files II, Professional Publisher, Archive,* etc, etc? What if you have a hundred disks, each containing from a handful to over a hundred files?

At this level of activity, you have difficulty knowing what files are connected with. Laborious manual record-keeping (and 'manual' includes typing details into a QL program) doesn't work for long; you find yourself getting fed up with the constant additions and revisions required. If you aren't convinced, think how many files the 40 MB Miracle hard disk can hold. More than a thousand files is a lot to identify. So, you need to split the files into groups, and put them under different, recognisable headings. It may be sufficient to put all files connected with one program into the same directory, but some users may feel the need to keep the program files, and data files created with that program, separate. The latter course means two directories instead of one, for instance, a directory named EDITOR for the program files and one named EDITOR_TXT for the data files. The second one would be a sub-directory of the first. Bear with me if you know how to set up such sub-directories on the Miracle hard disk – so do I, but that's not the problem.

Users who habitually run more than one program, and who invest in a hard disk, may want to have similar pairs of directories for each major program, and perhaps another for a category such as utility programs. They could easily end up with, say, four sub-directories beneath those sub-directories, for data files. A mechanism is then needed to enable both the programs and the user to know just where they/he/she are at any given moment, and to be able to access each sub-directory quickly, *from any other* sub-directory.

This is where my problem arose. Although the mechanism for setting up sub-directories seemed a bit strange to me, I set up several levels of sub-directory for various programs, and copied files to them, but I couldn't find a sensible way of accessing them all.

The catch

To enable a program to operate correctly, and find files which are not in the same directory as the program files, there is a command provided with the hard disk. This works fine, for the one program. What happened to me was that, when a second program was started, the two programs appeared unable to use their 'own' sub-directories, and likewise when any other programs were started. They all appear to end up using the same sub-directory, unless a change-directory command is typed-in at the keyboard every time you switch from one program to another. What happens when programs are actually running simultaneously, I don't know.

On a different level, when the user is utilising SuperBasic to do housekeeping tasks, there is no indication on the screen of which directory he/she is currently working in, and no straightforward way of getting into any other sub-directory. Maybe I've been spoilt by having a good utility program that displays all the sub-directories, and the files in them, and highlights the place the user is working in. Navigation from one sub-directory to another with that utility requires use of no more than the Enter and cursor keys. Even MS-DOS, with all its faults, provides a

SHOOTER

M S O L V E D

command to cause the cursor display (the 'prompt') to be accompanied by the full name of the current sub-directory, and another to enable the user to change from one sub-directory to another, *without affecting* any programs which are loaded.

Structure

First question: can the directory structure with QL hard disks reproduce all the features of the PC/MS-DOS structure? Second: is there an easy way of knowing where you are in the structure at any given time, and of moving to any other place? Third: can several programs be multi-tasked from sub-directories (with their data files in other sub-directories) and switched between without the necessity to type in commands to alter the default sub-directories? (I might add, on this last one, that it isn't satisfactory to me not to know which program you are going to get when you hit a particular key combination – that is, repeated keying of CTRL-C or such until you 'find' the program you want.)

My correspondent from Sweden is clearly a serious hacker. He is several years out of date in thinking I am Ron Massey (I don't think Ron would be too flattered by that!), and he seems to have a considerable collection of museum pieces. However, he also has some modern machinery, and obviously takes a keen interest in the micro scene in general. Like most of us, he can't afford to buy some of the computers which take his fancy. The list of what he has (or has had) includes ZX81, home-built Z80-type, Spectrum, C64, Z88, Mac-Plus, and QL. What he has, and what he would like, got a bit confused in translation (to English) but Amiga 500, Atari ST, IBM PC, (QL) Futura, Amiga A3000, PC3000 (?), Amstrad PCW, IBM PS/1, PS/2, and several others, were mentioned in the letter.

Ideas

Quite a few readers will undoubtedly have little idea of what some of those model designations stand for, and I won't bore them further with details. They're not QLs, for sure. What Larsson wanted to do was express some of his ideas for a QL-replacement.

There has been a trend on the part of QL hackers in the direction of the PC, from a hardware point of view, and Larsson goes along with this. A PC-type keyboard, for instance. Incidentally, the 'PS/2-type' label that seems to be popular in the QL world is presumably incorrect, and what is meant is either PC/XT-type or AT-type, the latter being the usual type supplied with current PCs. The PS/2 is from IBM, and the keyboards users are putting on their QLs are generally not from that source.

He also favours a box that doesn't look like a PC, but needs to be bigger than a QZL. As he says, one good selling point for the Macintosh is that it is obviously not a PC. You do need a box with space, to get floppy and hard disk drives in (maybe we should include cd-rom and other newer devices now?), a fan (almost inevitable), a large power supply, and interfaces for disks, printers, display, etc.

The tower (standing on end) configuration has appeal, but I suspect that is mostly from a marketing aspect and there is little practical merit in it. The argument that the tower takes up less space than the conventional flat box is rhubarb; if anything, a tower box has a larger volume (for reasons of strength) than an equivalent conventional PC, and most users would scarcely find it convenient to park the computer under a desk.

Same space

If a user fancies it, many non-tower boxes can be stood on end, but you still have to put the display on something – does it magically take less space when not on top of a computer box? Few computers now use the QL approach of putting the electronics and the drives with the keyboard, mainly because both electronics and drives on most current computers are far larger than the equivalent items in the QL. Miniaturisation has not gone anywhere near far enough for two or three drive units to fit in a QL-size casing, let alone all the electronics. The snag with the alternative approach of putting drives and electronics in the display unit is that this prevents any choice of display.

The display type can soon take the complete system way beyond the range of most of us. Larsson fancies an A4-size display, because it is good for dtp work, but my feeling is that serious dtp work requires pages to be displayed side by side, and that means something like A3 size. The only screen of that size I have used (it's great!) cost around £2,000, and that may be about twice what the ordinary individual buyer would pay for a complete system.

Moving back onto the desk/bench, he thinks 'a combination of mouse and numeric keypad (hamster) is not good'. Can you visualise a hamster alongside your keyboard? One thing is certain, and that is that the mouse must be an integral part of the computer, in both hardware and software terms, so that programmers simply have to access built-in mouse routines, rather than write their own.

Trackerball

The trackerball (almost an inverted mouse) has the merit of being suitable for incorporation into the keyboard, and at least one portable now has a slide-and-roll device installed in the middle-front of the keyboard. Whether or not such a device could replace the mouse for use with graphics programs is very debatable, but I doubt it at the present state of development.

There is no significant desire for disk units which can read/write in several formats, to enable data to be transferred on disk between different types of computer simply. Because of the enormous number of 5¼in and 3½in disks already in use, there is little commercial sense in specifying any other disk size. The 3½in size is gradually ousting the 5¼in, so it seems the obvious choice. Capacity is not so obvious; we already have 720 KB, 1.44 KB, and odd figures like 800 KB, and drives/disks giving 2.88, 4 and even 20 MB per disk are said to be ready for commercial use. The chances of the really-high capacity drives being able to both read from and write to current dsdd disks don't appear too good.

Leaving Larsson's letter for the moment, what about money? Does a QL-replacement need – by definition – to be cheap? And what is cheap to us? The usual logic of mass production has brought the standard IBM-type PC clone down to a cost which seems laughable when compared to many other, familiar items. How do you rate a PC system against a few weeks' supermarket shopping? Or petrol for a month or two? There are many basic systems being sold now for £200-300. But you don't get a fast 16-bit processor chip, colour display, and 40 MB hard disk at that price. For £1,000 you can get 16-bit operation and hard disk, but not a decent colour display. Any computer that will be able to run existing QL programs will not sell in large-enough quantities to be able

to get near this kind of price if equivalent features are provided. Maybe it is possible to get the features many of us would want for around £1,500, but don't hope for a good system for much less than this. Bear in mind that the display and drives are expensive items, accounting for maybe half the system cost.

Core

Returning to the letter, the operating system is at the core of the computer. It can make or break the computer. Larsson doesn't fancy the command line interface for the user. That is, anything that requires the user to type-in commands at the keyboard, as is the case with SuperBasic. The Mac popularised the graphic type of interface, utilising a mouse, and the current Windows program provides a similar thing on PCs.

QRam/QPac offer something along the same lines for the QL, although they seem to be biased towards the hacker type of user rather than ordinary types, and would be too complicated (and pedantic) for a mass-sale system. Although the old Ice set-up from Eidersoft is subject to some derision nowadays, it had several of the essential features for an easy-to-use interface, suitable for non-technical users.

So much for speculation. When you get down to what is real, the answer is – as always – Miracle Systems. Their add-on accelerator board for the QL may already be available when this issue reaches the news stands. Hopefully, it will be a 'halfway house' development, rather than a giant step. That is, something with a 68000 processor or, maybe, a 68020, not a 68030 or 68040 (there are later versions than these, but not in marketable computers, so far as I know). A jump to 16-bit operation, and 1 MB or more of memory, will be enough to satisfy many QL users, and the main point may be price rather than speed. The letters we receive make it clear that QL users are often not flush with money; it is not unusual to read that one of our readers is saving pension payments to be able to buy, say, a disk interface.

Printer prices

It may seem irrelevant to the QL scene to talk about laser printers, as I often do now, but prices continue to tumble. The dmp printer one bought when the QL was new has very likely gone down in price about 50% since that time, and several laser printer models have gone down that much in less than two years. Software[87] say that they are a bit surprised at the orders for their DeskJet printer driver and, if people can afford that printer, they can afford a laser.

The driver I have commented on previously, for the Epson GQ-5000 laser printer, costs £40; for this price, two drivers are supplied on the disk, and users of both the GQ-3500 (the earlier model) and the EPL 7100 (the latest one) can use either of these. The main difference between the two is that the 3500 driver does not access the Prestige fount, or the scaleable Times and Helvetica, but it does provide double- and treble sizeforms of the basic 3500 founts, as a partial substitute for the 6-72 points sizes available with the 5000 driver.

Pro Pub

An odd point to note for Kaga-Taxan users who have bought a laser printer is that it is preferable to use the FX-80 driver of text[87] rather than the Canon one, when printing on the laser in its FX-80 emulation mode. Some errors in alignment apparent in the samples included with a recent article appear to have been due to using the Canon driver, which has some functions which are not standard to the FX-80. The sample given here was done with the GQ-5000 laser driver, to show how well proportional spacing and justification is handled.

A significant improvement has been made to Digital Precision's *Professional Publisher*, reducing the loading speed by about two-thirds; the speed of other input/output operations is similarly improved. The ProPub Tools utility includes founts which are better than those with the basic program.

Dispute

There is something of a dispute being carried on within the pages of the Quanta newsletter, concerning the capability and ease of use of Professional Publisher. It was sparked off, to some extent, by my comments in an article on ProPub last year. I said that producing reasonable pages with that program was a distinctly lengthy exercise, **for me.** Some readers may not have fully considered what was said, because the main points made – apart from the obvious fact that serious dtp work requires lots of time, regardless – were that I was (and am) a novice as far as that program is concerned, and that the time spent using other programs to produce text and graphics input for ProPub was (is) a major part of the total time involved. The raised hackles of certain correspondents (plus a well-known supplier!), and my own present interest, combine to suggest more attention be paid to the subject of dtp, so expect more comment on this subject in future articles.

The Portuguese supplier *Qfile* sent in version 2 of *Discopy*, and we hope to print a mini-review of this updated version before too long. The program now comes with a nice, printed instruction booklet. The address for orders is the same as before – Qfile, Apartado 2110, P-1103 Lisboa Codex, Portugal. The author of the program (and of *MS-QLink*) obviously has a busy life, earning his living during the day and finding a few hours at night for his QL. He comments that text[87] corrects his spelling, but doesn't improve his sentences! That's a really heavyweight subject for any programmer to get his teeth into, and the QL market wouldn't reward any efforts in this direction very well. Maybe we could ask for a smaller step, such as making a spelling checker capable of spotting errors such as double use ('the the'), incorrect forms of words ('too' where 'to' is required), sentences started with small letters, and so on?

Readers' Letters

Digital Precision report not finding anything wrong with a *Professional Astrologer* disk returned to them by **D.S. Graham,** but they sent a replacement last August. As Graham wrote since then to say he was still waiting for a replacement, another one has been sent (February). **Michael Cronsten** should by now have received a Miracle hard disk from **TK Computerware,** to replace the one that apparently went astray. The replacement was sent before Christmas. There was some delay whilst the Post Office processed the claim for loss of the original unit. **TK** comment that **Mike Jackman's** problem using *TechniKit* is (so far as they are aware) related to using the program on a Thor (model unspecified), for which the program was not written. Attempts by them to contact **Thor International** for information on Thors have failed (has anyone managed to get a response from Thor International in the past year?). **Frequency Precision** have sent the batteries ordered by **J R Goodall**; as the latter regularly has problems with items despatched to him in Belize, it is not surprising to hear that his original order letter was not received, and the order was despatched only when a chase-up letter arrived.

Frequency Precision sold a fair number of their battery-backed power supplies for the QL, and these seem to have been effective in dealing with lockups caused by poor mains supplies. As this supplier is not now selling this unit, it has been suggested that construction details may be given to QL World readers in the form of an article, so that DIY readers can build their own power supplies. Watch for an article on this in a future issue.

We are all anxious to receive the new piece of software we've just ordered, but some buyers' enthusiasm seems to overcome them. One supplier reports receiving a chase-up call from a customer *on the same day* the cheque for the goods was sent! Another customer chased delivery of goods, ordered by credit card, within four days of placing the order, apparently unaware of the fact that authorisation for credit card purchases is not automatically given straight away; in this case, five requests were made (over several days) before authorisation was given by the card company. The obvious explanations appear to be either that the customer had not paid a previous account off and was above his credit limit, or that the card company's computer system was having an off day (or two).

QL SCENE

More information from the Pure QL Show

The National Dutch QL Users club, Sin_QL_air now have a list of addresses and prices for hotels and boarding houses near the site of the Pure QL Continental Microfair, first announced in *QL World* March 1991. As we write in mid-April, Sin_QL_air is requesting clubs and suppliers to attend the Fair with demonstrations, and is expecting to demonstrate progress on its own Sigma-QL68008FN10 4 megabyte QL project.

Further information about the Fair can be accessed on the Club bulletin boards (Netherlands) 035 216520, 300/1200/2400, 1200/75-T, 24 hours, and on the QLAT bbs, 030 962265/2,283,508, 300/1200/2400, 1200/75, 24 hours.

The site and date of the Fair is St. Joriscollege, Roostenlaan 296, Eindhoven, Netherlands, on 6 May 1991 from 10am to 4pm. Contacts are **J J van der Molengraaf, Mullerweg 17, 5624 JC Eindhoven, Netherlands, tel. (Netherlands) 31 40 442309,** English-speaking, for hotels, dates, local organisation, or **C M H Biemans, Elzenstraat 5, 5461CL Veghel, Netherlands, tel. (Netherlands) 31 4130 63224,** in German, English and French, for club contacts and details of the user group and its publications.

Essex workshop cancelled

It is with regret that we have to report the death of Bob Gingell, active Quanta member and organiser of the Essex Workshop on 18 May reported in last month's QL World. This event has been cancelled, Quanta members particularly will appreciate Bob's work organising events and will miss him greatly.

Colleague Ron Dunnett contacted QL World to say that he and Bob's son had tried to pick up the threads after Bob's death, but had been unable to do so to their satisfaction at the same time as coping with the family tragedy.

Said Ron, "The Workshop was Bob's baby. He had put a lot of work into it, and it was the first thing on his mind when he went into hospital. His death was very sudden and unexpected." It is expected that the Workshop will now take place in September.

QL club in Norway

A Sinclair club, NASA (Norwegian All Sinclair Association, and not to be confused with the well-known space agency of the same acronym) has been formed in Norway. The group publishes a Sinclair-orientated magazine called with great simplicity *Sinclair Magazine*, every two months, and also offers help to members with technical or software problems.

Contact them via P Monstad, NASA, N-5580 Oelen, Norway.

More than just a chair . . .

The Multi-User Personal Resting System

The latest in space-age personal comfort devices as featured in our photograph is the new Rexel Multi-user Personal Resting System as supplied to a waiting world by Action Computer Systems of Wembley, Middlesex.

Within the System, models are available tailored to the needs of three classes of user: operators, programmers and managers. Despite the progression from the lower forms of life to the higher, each and every module contains an adjustable mounting, a support service, a rear support and two (2) side supports.

Mountings, say Action, can be adjusted between a wide range of heights, allowing maximum flexibility in users' leg-lengths. The support surfaces are made from moulded foam, and the rear supports contoured (it is not fully clear from the literature whether the 'rear supports' are the horizonal or vertical non-open-space-filled surfaces, but both give the visual impression of conserable comfort).

The systems are not themselves programmable but, Action advise, this difficulty can be overcome by programming users.

For example, installation of a simple 'warning/dismissal' package will normally ensure that the majority of casual users will avoid the resting system known as the 'manager's chair'.

(A similar package, calling down the Curse of the MacSporrans upon casual users and other low life, has been in operation on a chair in this editorial office for a number of years. The QL: first in all things.)

The Rexel Multi-User personal Resting System conforms to a number of important British Standards with reference to design and fire safety, and comes in red, blue or grey. The last laugh is definitely with Action and Rexel, as prices range from £153.90 for the 'operator's chair' to £262.80 for the 'manager's chair'.

Action Computer Supplies also sells, yes, computer supplies (leading brands), hardware and software, office automation and datacomms equipment and other useful things at discounted prices to users through its 496-page free catalogue, and can be contacted at **Alperton House, Bridgewater Road, Wembley, Middlesex HA0 1EH. Tel. 0800 333 333.**

Archive Answers

Robin Sevenson continues his occasional column by simplifying two common functions: totalling and averageing

One of the commonest things-to-do with a database containing numbers is to add them up. You can do it from *Archive* command line, with an instruction such as 'let answer=0: all: let answer=answer+number: endall'. This gives you the total of all the 'numbers' in your database, stored in the memory variable 'answer'. Possibly the next commonest thing to do is average the total: 'let average=answer/count()'. It starts to get cumbersome if you wish to look at several different fields from the file, and is no use at all if you want to deal with lots of sub-groups within the data file.

The purpose of this *Archive Answers* is to simplify the process of sub-totalling and averaging of Archive data. We shall look first at the production of sub-totals – adding up all the entries for particular subsets of the data. The problem with sub-totals is that you can end up with quite a lot of them, to be stored or otherwise displayed. You could print them to paper, but then you can't do anything else with them. The ideal place for sub-totals is in another data file, where they can then be displayed, printed, or otherwise manipulated as needs dictate.

The program does precisely this, with any database file you wish to use. It automatically generates a new file, with an identical field structure to the original, leaving the first file unaffected. Each numeric field is added up, and a new sub-total record is added for each different entry in the 'key-field'.

A little explanation about subsets and key-fields may not go amiss here. The assumption behind a subset is that the same subject is dealt with a number of times in the file. The key-field will be identical for each member of the subset, and the sub-total for any one subject is the sum of all the values relating to it.

For example, you may have a database of cricket scores. The players each have lots of entries – one for each innings they played. Each record could store, among other things, 'name$', 'team$', and 'runs'. If the statistic you want is each player's total runs for the season, the key-field would be name$. There would be a subset of the records for which name$ is 'Gower,D'. By adding up all the runs in these records we can calculate the required statistic. This process is repeated for all the players in the database.

The same data can be used for a different statistic – the total runs scored by each team. In this case, instead of name$, you would make team$ the key-field. The sub-totals would then be for all the records for which team$ was identical.

The key-field must also be the field used to ORDER the file. If it is not, the various entries for each subject would be scattered around the file, making it very much harder to match them up. By ordering them, it is possible to step sequentially through the file, knowing that all the entries for each person (for example) are grouped together.

The program printed in **listing one** is simple to use, because it automatically tailors itself to match the file in question. Once you have entered the listing (as two separate procedures, using EDIT), and saved it (eg SAVE "TOTALS") you can try it out, using the gazetteer database, GAZET_DBF. Unless you have moved it, this will be on MDV1_ (or FLP1_), along with the Archive program. It includes data on population, land area, etc. for a wide

Listing One - Totals and Averages.

```
proc CopyStruc;Oldfile$,Newfile$,Log$
  local COUNT,MAX
  let TEMPFILE$="TEMP_EXP" : REM Use RAM drive if available.
  use Oldfile$: let MAX=numfld()
  print : print "Copying structure to "+Newfile$;
  spoolon TEMPFILE$ export
  lprint "proc temp"
  lprint "create '"+Newfile$+"' logical '"+Log$+"'"
  let COUNT=0: while COUNT<MAX
    lprint fieldn(COUNT)
    let COUNT=COUNT+1: endwhile
  lprint "endcreate"
  spooloff : merge TEMPFILE$:Temp
  use Oldfile$: print
  endproc
-------------------------------------------------------------------
proc MakeList;Source$,Dest$,Opt,KeyField$
  local C
  let C=0: while C<numfld()
    if fieldt(C)=0 and lower(fieldn(C))<>KeyField$
      lprint "let ";Dest$;".";fieldn(C);"=";
      if opt=0: lprint Source$;".";fieldn(C): endif
      if opt=1
        lprint Source$;".";fieldn(C);"+";Dest$;".";fieldn(C)
        endif
      if Opt=2: lprint Dest$;".";fieldn(C);"/SUBTOTAL": endif
      endif
    let C=C+1: endwhile
  lprint "update '";Dest$;"'"
  endproc
-------------------------------------------------------------------
proc Calc;Source$,Dest$,KeyField$,Av
  local COUNT,ANY$
  spoolon TEMPFILE$ export : lprint "proc Temp;Fst"
  lprint "IF ";Dest$;".";KeyField$;"=";Source$;".";KeyField$;
  lprint "and Fst=0"
  MakeList;Source$,Dest$,1,KeyField$
  lprint "else"
  if Av: lprint "if Fst=0:Avtemp: endif": endif
  lprint "append '";Dest$;"'"
  lprint "print: print "+KeyField$+";' =';: let SUBTOTAL=0"
  lprint "let ";Dest$;".";KeyField$;"=";Source$;".";KeyField$
  MakeList;Source$,Dest$,0,KeyField$
  lprint "endif": lprint "endproc"
  if Av: lprint "proc Avtemp"
    MakeList;Source$,Dest$,2,KeyField$
    lprint "endproc"
    endif
  spooloff : merge TEMPFILE$
  first Source$:temp;1: next Source$
  while not eof(Source$)
    let SUBTOTAL=SUBTOTAL+1
    print num(SUBTOTAL,4);rept(chr(8),4);
    temp;0: next Source$
    endwhile
  let SUBTOTAL=SUBTOTAL+1
  if Av:Avtemp: endif
  print num(SUBTOTAL,4)
```

```
    input "Press <enter> to continue...";ANY$
    endproc
-------------------------------------------------------------
proc Total;Source$,Dest$,KeyField$
    use Source$
    CopyStruc;Source$,Dest$,"Total"
    print : print "Totaling "+Source$+" to "+Dest$;
    Calc;Source$,"Total",lower(KeyField$),0
    use "Total": first : display
    endproc
-------------------------------------------------------------
proc Average;Source$,Dest$,KeyField$
    use Source$
    CopyStruc;Source$,Dest$,"Average"
    print : print "Averaging "+Source$+" to "+Dest$
    Calc;Source$,"Average",lower(KeyField$),1
    use "Average": first : display
    endproc
```

range of countries, and you may wish to know these values for each continent covered. In this instance, the continents are the subject, so 'continent$' is to be the key-field. After opening the file, it must be ordered by continent, after which the 'Total' procedure is called. The steps to do this, entered at the command line, are as follows:

LOOK "MDV1_GAZET" LOGICAL "GAZ"
ORDER CONTINENT$;A
TOTAL;"GAZ","TOTCONT","CONTINENT$"

The first two lines are standard Archive instructions. The third calls our new procedure. Three extra parameters must be included when using Total. These are the 'logical file name' of the source file to use, the actual file name of the new file to be created, which holds the sub-totals (this can include a device name), and the name of the key-field. As the program progresses it shows the number of countries it has found for each continent. When the program finishes (and don't expect an instant result if you are using microdrives), you will have a new file called 'TOTCONT_DBF' (logical name Total) with 11 entries, one for each of the 11 continents.

No, I hadn't realised there are 11 either, but now you can find the land area of continents you didn't even know existed.

It is quite easy to view the results. Each time you type 'NEXT' the next record will be displayed on the screen, allowing you to see the data for each continent. We shall look at better ways of viewing and printing Archive data another time. To calculate a grand total you can run the program again, using the sub-total file as the source file, and one of the other (now blank) text fields as the key field. (You will need to close Total, and then open it again with a new logical name, as Total is needed for the next new one.) In this way a third file will be created, containing one record of the grand totals. When you have finished with a file you should close it, and if you don't wish to keep it you can delete it (eg by typing KILL"TOTCONT_DBF").

We shall now look at that statistic so beloved of cricket fans, the average - or arithmetic mean. The 'Average' procedure works in exactly the same way as Total. If you have just carried out a Total operation Gazet will still be opened and ordered. (If not you must enter the first two instructions shown above.) To produce a file of averages, the following line can be used:

AVERAGE;"GAZ","AVERCONT","CONTINENT$"

This will generate another new file, this time called AVERCONT (for which read Average for Continents). Again it will have 11 records, but this time each will tell you the population and area of an average country from the continent concerned. As before, we can get a global average by running the procedure again, but using the new file, and a blank field as the key-field.

A brief explanation of how it works may be of interest to some. It uses the trick of getting one program to write another procedure, which it then loads and uses. This process happens twice. The first time is from the 'CopyStruc' procedure, which writes a program to create a data file with an identical structure. CopyStruc is a stand alone procedure, which is useful for all sorts of other purposes. It requires three parameters – the logical name of the existing file, and the physical and logical names of the file to be created.

The rest is done by the procs 'Calc' and 'MakeList'. Proc Calc does the bulk of the work, creating the temporary procedure which will do the adding up. However MakeList writes the actual addition and assigning routines. Each numeric field must have its own lines, both for adding extra entries, and for assigning a new number at the start of each subset. MakeList is called for each of these, using Opt to specify which.

If Calc is being used to average (for which the 'Av' parameter is set to 1), MakeList is called a third time. This writes an extra procedure, proc Avtemp, in addition to proc temp, which does the job of calculating the averages. After running either Total or Average, you can examine the temporary procedures by using EDIT. Don't try changing them directly though, as they will be overwritten next time the program is run. All corrections and enhancements must be made to the program which writes these procedures.

Once the new procedures are written Calc steps through the source records, calling the temporary procedure (proc Temp) each time, and displaying the running total of records processed. Two global variables are employed. TEMPFILE$ stores a file name for the temporary procedure files – use a ram drive device if you have one, to speed up execution; and SUBTOTAL keeps track of the number of records found for each subset.

As printed, the program produces a bare minimum of output data, to perform the tasks in hand. One reason for this is to retain an identical file structure to the original. Programs, and sedit screens which use the source files may also be suitable for the new one. However there are plenty of possibilities for embellishing it, for anyone who fancies a bit of tinkering with the code.

One possibility would be to add an extra record to the next file, in which could be stored the grand totals, or global averages. A few additions to proc Calc, so that proc Temp can be called twice, would enable it to add each source record to both the first (for the grand total) and last (for the current subset) records of the new file.

Another possibility would be to store the number of entries found for each key-field. To do this you would have to customise proc CopyStruc, so that it added an extra field. It would then be a necessary to assign SUBTOTAL to this field each time, in proc Calc.

Both Total and Average can be used on any Archive data file, and will add or average all numeric fields except the key-field. A word of warning may be in order here. The figures produced will have more meaning in some cases than others. For example, the 'gdp' field appears to be Gross Domestic Product per capita gdps for a continent is a meaningless figure. (I'll leave you to work out why). The average gdp is a little more sensible, being an average of average figures. The actual per capita. (The currency is not specified.) The Total of per capita gdps for a continent can only be found by dividing the sum of total gdps by the sum of the populations.

All of this goes to show that even with simple statistical work you must understand what the source figures actually show, which calculations are appropriate for your purposes, and what the resulting figures mean. Without this you can produce garbage statistics with any computer, be it a QL, Unix workstation, or Cray supercomputer.

SOFTWARE FILE

PERFECTION

Long-awaited, much discussed, now revealed: Mark Knight prods the new WP from DP.

Perfection is the new Digital Precision word-processor. With such a name to live up to, users might well expect a great deal from the program – if you like short reviews, it's my opinion that users will be highly impressed. Great emphasis has clearly been placed on the need to make the program easy for existing *Quill* users to adapt to: Digital Precision have told me that they used a wide selection of beta-testers during this project, and that the beta-testers included some very dyed-in-the-wool Quill-lovers.

Despite visual similarities to Quill (and many similarities in keypresses) both the feature list and the performance (in speed terms) of Perfection make Quill look poor indeed by comparison. Perfection not only outperforms Quill running on a QL, but seems to live up to the advertised claims of outperforming other programs (such as PC programs like *WordPerfect*) running on much faster hardware. The whole program shows signs of being an ambitious project designed to meet the needs of real users, well managed from start to finish.

Perfection is intended as a serious word-processor for the QL, both for the technically competent user who wants to do serious work without having to downgrade to an MS-DOS machine and for the everyday Quill user who has found word-processing programs other than Quill too complicated or user-unfriendly.

Slow Quill

Quill has many faults – not the least being its speed – with perhaps a good claim to being one of the slowest word-processor programs written since micro-computers became popular. To be fair to Quill, it was written in a hurry by a programming team working without the benefit of a fully finished QL, with the QL release date looming. Given this, it is a tribute to Psion's team that Quill has the advantages that it does.

Digital Precision have been able to spend a lot more time on Perfection, and have had access to Qls for six years or more. To an existing Quill user who has found such programs as DP's *Editor* or *Editorial Special Edition* too complex, Perfection will seem like a gift. Coming back to one of the core features, there is a strong surface resemblance to Quill, with the menu and prompt window at the top of the screen, the main text in the centre, and a status line at the bottom. Like Quill, the menu window can be switched off using F2 and, if present, it is updated to show the available commands. Again similarly to Quill, the command menus are called up by pressing F3, but unlike Quill repeated pressed of F3 are used to cycle between the menus (A-B-C-D, or SHIFT/F3 to cycle in reverse D-C-B-A) rather than Quill's less logical – and slower – F3 followed by "O".

Perfection has four of these menus, rather than Quill's two, and so has more functions. Perfection has very good WYSIWYG (What you see is what you get) display features, showing superscript and subscript properly (as Quill does), bold text in a differing ink colour, and italics as italics, which Quill does not. For other printer fonts or features, a number of different paper colours behind the characters can be set up so that these are clearly indicated on-screen.

Simple to learn

The similarities to Quill make the program simple to learn for the less technically minded, but Perfection has a feel very distinct from Quill, whose users frequently find themselves waiting for the program to catch up with them. I did not find this with Perfection. I can back up DP's claim that the program has a simple and largely familiar user interface, as I had no manual of any kind – either on paper or on disk – for the first part of the review period, yet I experienced no difficulties using Perfection. Some of the more advanced features (like programmability) would require the manual, though possibly only while learning: but all of these seemed to me to be features that would be rarely used by the Quill veteran.

Help in Perfection is great. When you press F1 to ask for help – which works even if the program disk is absent – your document is simply hidden from view while a help document instantly replaces it. The Help text lists all keypress combinations and their effects (including ones like CTRL/C and ALT/ENTER, which have special uses outside and inside Perfection but which will be unfamiliar to many Quill users). It also explains status line codes and illustrates the hidden attribute characters – more on these later.

Slow Quill

Within the Help text all the usual Perfection navigation commands work. Search is particularly useful, so you can find specific help on any item – a search for 'para', for example, would allow you to find all the commands that related to paragraph handling. Once you have finished with Help, press Esc or Enter or similar to return – instantly – to your document. If you want to customise the Help text, or replace it with whatever reference or other work that you wish to be displayed in response to F1, all you need to do is to Load the Help text as you would any other document and modify it.

Perfection, where different from Quill, is different for sound reasons, and once the user gets accustomed to the difference Perfection seems the more sensible of the two programs. To illustrate: while Quill does provide default strings in response to some prompts, it is inconsistent as it does not provide, say, a default Search or Replace string. Perfection always supplies an editable default provided the command has been previously used: in this case, it defaults to the last strings searched for and replaced. With Perfection, the edit cursor is presented at the end of the default string. Where Quill offers a default string – on Save or Load, for example – the edit cursor is at the start of the default string, which is not where it would appear if the string had just been typed in.

Perfection's status line contains much more information than Quill's. In addition to what Quill provides, Perfection displays ten indicators, showing the status of CAPS LOCK, word wrap, case sensitivity, block status, justification, etc. The word count is more accurate than Quill's. In addition to a Quill-type line count within the page, there is a readout for position measured in lines from the top of the whole document, for the number of characters in the document (two numbers, one a total including hidden attribute characters and the other excluding them), for the total number of pages, the number of lines per page and the character code of the character beneath the cursor.

Slow Quill

Most QL text-handling programs are non-WYSIWYG: such programs are much easier to produce. A WYSIWYG text program (not desktop publisher) must have either a system of pointers into the file, or markers within the file, showing where changes in attribute occur. Perfection uses the marker system because the pointer system, while simpler to program, is slower especially when there are a lot of attribute changes and subsequent editing. Perfection's marker system comprises hidden attribute characters – like Bold on – which are invisible (except when you ask Perfection to reveal hidden codes) to the user, but whose effect is to switch an attribute on or off. In contrast, Editor's system was to use visible markers (say B with a line above it for Bold on) which had no on-screen effect (Editor is not WYSIWYG even in document mode). Perfection way is better: bold appears bold.

Part of the Perfection ideal is to respond instantly to the keyboard, so that work can proceed rapidly on a document: with this in mind, the program implements a lazy screen, as Editor does. The lazy screen effect is seen when you scroll through the document. If an up/down arrow key is held down for continuous movement, the cursor will first move to the top/bottom of the screen (as with Quill) but then, instead of scrolling the whole text screen, just the line containing the cursor is scrolled. The single line can obviously be scrolled much more rapidly than the whole window, and as soon as the cursor

is released the whole window is updated. For those who find lazy screen a distraction or an annoyance – many Quill users will – it can be switched off so that the whole text screen is always scrolled as one unit. Even with the lazy screen switched off, Perfection is about twice as fast as Quill.

There are also 'lazy attributes'. This feature is best described by illustration: after a jump from the top of a 400K document to the bottom, the program will present the text on-screen immediately, permitting all operations – including all editing and cursor movements – to be carried out, and then a few seconds later, will introduce the bold, italics or other attributes that have been set, painting over the visible text. This delay is the only thing that I found that could, for me, be a slight irritation. But as the delay is only significant with really long documents – say a hundred pages or so – it is unlikely to bother most users. I must stress that you do not need to wait for the attributes to catch up (even though the wait would be several seconds at most) and that no error or problem can result from this feature.

F3 and shortcut

Unlike Quill, Perfection has a wide range of direct commands entered by pressing key combinations: in fact, everything that can be selected by pressing F3 and then a letter can also be selected by a keyboard 'shortcut'. This means that as users learn, they can if they wish bypass the menus entirely and go over to the system of direct keypresses, speeding up work enormously. There is also a macro interpreter which allows your prerecorded sequence of keypresses to be played back, automating frequently repeated jobs. This programmability is only intended for advanced users.

Editor owners are still well served by that program for editing machine code files, files with initially unknown formats, and some other files containing certain non-printable characters. Editor, however, is much slower in document mode, as the document mode was an add-on that compromised Editor's philosophy of the clean file. Perfection is much superior to Editor for all word-processing, as well as for use as a simple database and for handling most types of Ascii files. Major annoyances with Editor include the requirement to leave blank lines between paragraphs. Perfection of course, does not need these. Editor is also painfully slow at reformatting paragraphs (getting a paragraph to honour changes made to margin, tabulation and justification settings) – Perfection is many times faster. Perfection – unlike Editor – also discriminates between soft and hard spaces – hard ones are those you put in, or which were created when you opted to expand tabs (Perfection allows asymmetric tabs). Soft ones were put in by the program when justifying: if you justify anything by mistake with Perfection, recovery is easy – with Editor, it would be a tragedy.

Dual windows

Another Perfection feature on many user's wish-lists is the dual window mode, in which Perfection splits the screen into two windows, and allows one window to contain a snapshot into the text (at any position), while editing continues in the other window. At any time, a single keypress will switch editing between the two windows. This snapshot feature is mentioned in DP's advertisements, but the ability to switch between windows for editing was a bonus I had not expected.

The integrated spellchecker is a brilliant addition. There are three modes of operation, all of them very flexible. The most common mode in QL spellcheckers is the check-as-you-type one, where words are checked against the dictionary as you type them. In this mode, the Perfection spellchecker will beep when an error occurs, ensuring that the user can correct the mistake straight away; as an alternative, the user can type the whole document and then come back afterwards and search for the marker character, which is put into the word when the mistake was noted by the program. You can type as fast as you want - you'll never beat the spellchecker.

Documents loaded into Perfection can be checked in memory in one go, after typing or loading is finished. Spellchecking in this mode is extremely fast, well over 500 words per second on my test QL, with a fair number of typing errors in the document. This speed should not be taken as fixed, as it will depend upon the number of errors in the document being checked, the QL memory expansion in use, the average word length, and possibly other factors unknown to me.

Peak speeds

More errors in the text will mean a slower performance, but with a new Trumpcard higher speeds are likely (DP claim a peak speed of about 1100 words per second on a QL, 3000 on a Thor XVI or ST QL Emulator). A variation of the internal checking allows for a user-defined block (from any one point to any other point, or to make the definition of the area to be checked faster, from any given page to any other page) of the text to be checked. This is much better than forcing the user to check the whole document. Of course the block could be as small as a single word.

It should be pointed out that the large dictionary (about 225,000 words) will not fit into QLs other than those fitted with the largest ram-size Trumpcard (with 768K, giving the QL a total of 896K). There is a medium sized dictionary of around 150,000 words – three times larger than the nearest QL competitor – for 640K QLs. With either the large dictionary in a Trumpcard QL or the medium dictionary in a 640K machine, there is still room for about 25 A4 pages in ram. There is a third, smaller (but still adequate) dictionary for those who want to multitask the program with other QL software, or who want to write really large (hundreds of A4 pages) documents. Of course it is also possible to use the medium dictionary with the 768K Trumpcard, allowing a small book to be spell-checked in memory.

While on the subject of ram, Perfection is 30K smaller than Editor SE and only 12K larger than Quill. More importantly, Perfection would appear to be more economical with its use of ram than other word-processors. Quill grabs all the ram in the machine unless active steps are taken to stop it doing so: also, Quill has undocumented restrictions preventing it from being used with really big files. The Editor is better behaved, allowing you to specify the amount of memory to be used: however, there is no way to change this without losing the loaded document, and changes often result in heap fragmentation.

Memories

When memory becomes short, Editor makes you wait while it garbage-collects – this can take from a few seconds to an annoying five minutes or so – and can easily run out of memory. Perfection has none of these problems: it grabs and returns 4K blocks of memory automatically, so it never has more or less memory than it needs, and it does this without fragmenting the heap. Indeed, Perfection has the management capabilities of a small operating system. Editor also uses up more ram than Perfection when storing a file: it has an overhead of 5 bytes per line (4 for address, 2 for length less 1 for missing eol character), which for average lines is about 10% loss: better than Quill. Perfection's overhead is 48 bytes per 4K, plus a little slack space per block (which helps make editing faster) – so that the loss is minimal at about 2%.

I suggested to Digital Precision that using the large dictionary would slow the impressive checking performance, but they informed me that the dictionary sizes do not affect checking speed noticeably. This is because of the unique dictionary structure, which is apparently highly indexed to a variable depth and takes account of word-frequency.

Users may create their own dictionaries too, and the Perfection spellchecker can be instructed to use two dictionaries at once, allowing supplementary dictionar-

ies for technical or other specialised purposes to be constructed. Any of the supplied dictionaries can be the main dictionary, with the user's own dictionary searched either first or second, depending upon experience of which results in faster checking.

All dictionaries are highly compressed. I saw the word list for which the large dictionary was constructed – in uncompressed form, it occupies 2.3 megabytes, which is very big.

Spellchecker

The third spellcheck mode is to ask for the checking of a file already on disk, and as the spellchecker is a separate, multitasking program, this can even be done while the user is also editing another document. Perfection has a software convention for communicating with its satellite programs (of which the spellchecker is one), so that the spellcheck program is just another option on the command menu. This has been done so that the non-technical user, who is terrified by – or hates – complexity, need not know or care that the spellchecker is a separate program.

Another satellite program provided allows graphics saved from *Professional Publisher* to be incorporated into Perfection pages, even allowing more than one illustration per page. Of course, you must not try to use a daisywheel printer for graphics output (for all other purposes, Perfection works fine with all types of printer – daisywheel, inkjet, dot matrix and laser). I felt that Perfection would have been even better if it was also able to use *Eye-Q* graphics files, as more people own Eye-Q than Professional Publisher, and more people would be willing to purchase the cheaper program for the purpose of simply adding graphics to their pages. Digital Precision replied that they chose the Publisher format as it is more flexible, allowing image sizes from postage stamp to full page A2, and that very high definition can be obtained with output in quad density mode from big pages.

Printer driver

Perfection purchasers who have many Quill files, and who have gone through the sometimes considerable pain of setting up printer drivers for their own printer may dread the thought of starting all this again with a new program. Perfection avoids all hassles by automatically using Quill printer drivers without alteration. Of course you can add features to these drivers after the automatic conversion, for example adding your printer's codes for italics, or adding more translates than Quill permits. If you do not have a suitable Quill printer driver, you can use the supplied default drivers or modify them or start from scratch and build your own.

Converting from a Quill document to a Perfection document could not be simpler – there is no conversion required. Perfection will load Quill documents just as it loads Ascii or Perfection files — it automatically discriminates between them, and at a similar speed to that of Quill (though very long Quill documents will be loaded much more quickly by Perfection). When Perfection saves a document, it does so either in its own native format or as Ascii – you select which, the default is its own format. I fully understand why Digital Precision have not bothered to give the user the option to save the file in Quill format – I can see now reason for the user of Perfection go back to Quill. If the user must do this, however, he can output from Perfection in Ascii, and import into Quill.

Minerva works fine with Perfection.

Benchmarks

Perfection is the fastest word-processor for the QL, despite it being WYSIWYG. The other WYSIWYG word-processors for the QL are Quill and Text^{87}; while Text^{87} is faster than Quill (even with *TurboQuill Plus*) Perfection is much faster than any of them. This is perhaps not surprising as the leader of Perfection's programming team, Steve Sutton, has a record of producing fast and compact code – he is the principal author of *Lightning*.

The speed of Perfection is such that it is more than sufficient to see off the non-WYSIWYG brigade as well: even the quickest editors for the QL, including Digital Precision's own, are nowhere near as fast. *Flashback Special Edition*, which is a card-file database renowned for its excellent speed, was used as a benchmark by Digital Precision during the development of Perfection, I am informed, and there is virtually no speed difference between the two on tests involving scrolling and searching — a compliment to both.

Benchmarks are of limited use, but carefully chosen they will give a general idea of the relative speed of programs. I've used small, medium and large test files for the tests, but omitted to run Quill on the large one as I simply do not have the time to spare (some of the tests with Quill on the large file could have taken hours or days to complete).

Versus Editor Special Edition in its normal mode:

Perfection took 13 seconds to load the large file: Editor SE took 116 seconds. To find a unique string towards the end of the file, Editor SE took 163 seconds. Perfection took less than three seconds: indeed, timing Perfection on some tests was very hard because it was so fast.

Perfection was three times as fast as Editor SE when globally replacing a common string. Scrolling tests – performed with lazy screen off – showed Perfection outperforming Editor by around 12%: both are very fast.

Versus The Editor Special Edition in its document mode:

This is the mode in which Editor behaves more like a word-processor, albeit at a considerable cost in speed. Perfection took 5 seconds to load a file and Editor SE took about 7 minutes (about 90 times slower). Perfection's navigation to the bottom of the file was instant, while Editor SE took 17 seconds (Editor SE in normal mode would also have been instant – it is the overhead of having to calculate page breaks, etc, that slows it down). On Perfection, deleting and adding lines, as well as changing page length were all virtually instant (taking a small fraction of a second): Editor SE was sluggish, maybe upto a thousand times slower. Editor SE was four times slower on a global replace, and 35% slower on scrolling.

Versus Quill:

Perfection was 60 times faster than Quill at importing an Ascii and 10 times faster at loading an 'own format' file. Saving was 10 times faster on Perfection. Perfection is about 60% faster at scrolling down and 100% at scrolling up, again with lazy screen disabled. If lazy screen is on, Perfection is many times faster. TurboQuill Plus helps, but Perfection still has a huge advantage.

Good . . .

Of course, different types and shapes of file will produce somewhat different timings – I am not aware of any bias in my choices. It is inconceivable that my overall favourable conclusions about Perfection's speed could be adversely affected by choice of file.

Digital Precision have made many claims for Perfection, perhaps the biggest implied by the name chosen for the program. The name is certainly brave, perhaps begging to be shot down, but I would be dishonest if I gave it anything other than an enthusiastic review. I have found it to be simply excellent, easy to use, fast, packed with features (far more than I have space for in this review – I haven't even mentioned the configurator) and very well thought out. I can find little to say that will convey just how good this program is, except to quote Digital Precision's own advertising: Perfection will blow your socks off. Perfection is the program that Quill users have been waiting for.

INFORMATION

Program: *Perfection*. Needs 256K Ram minimum, plus at least one disk drive.

Price: £79.95. With *Spellchecker*, £119.95

Publisher: Digital Precision Ltd, 222 The Avenue, London E4 9SE. Tel. 081 527 5493.

MIRACLE SYSTEMS

MASTERCARD VISA

Microdrive users - read this ...

NEW TRUMP CARD

£225 inc. (£198 export)

RAM + Disk interface + firmware

We have re-engineered the TRUMP CARD 768K to use the new 1 Megabit DRAM memory chips. This new design runs about 20% faster (twice the speed of the QL's internal RAM) and uses less power than the previous one (still available in the 256K size). It holds the same firmware:

- TOOLKIT II which comprises more than 100 additions and enhancements to the QL's Superbasic and operating system including an on-screen alarm clock, wild card copying, accessing remote devices on other QLs equipped with a ROM-based TOOLKIT II via the network.
- a printer buffer which can be used to buffer the serial ports (the size of which is limited only by the amount of free memory) letting you get on with something else whilst the printer is printing.
- a screen dump facility to copy all or part of the screen image to most types of dot-matrix printer including some colour ones.
- a RAM disk that allows you to access the memory as you would Microdrives or floppy disks for fast file retrieval (please note that RAM disk contents are lost after switch-off or reset).
- a memory cut that resets the QL to appear as an unexpanded 128K type for the few early programs that refuse to run in expanded memory.

The disk interface can access up to 4 disk drives (e.g. our DUAL 3.5" plus our 5.25") and has the same commands as are used for Microdrive control. There is an additional command FLP_USE which can be used to divert all MDV accesses to FLP (the floppy disk interface device name). This makes the transferring of your software from unprotected Microdrive (i.e. the majority of QL software including Quill, Abacus, Archive and Easel) to disk a trivial task. A simple step-by-step guide for transferring Quill as an example is given in the comprehensive TRUMP CARD USER MANUAL supplied with the TRUMP CARD.

The TRUMP CARD 768K's RAM adds to the QL's own 128K giving a total of 896K. Like the firmware the extra RAM is installed automatically when the QL is switched on so that no installation procedure is necessary. The exception to this is TOOLKIT II which can be left uninstalled for compatibility if you have other toolkits; installation consists of simply entering the command TK2_EXT.

Fitting the TRUMP CARD 768K is easy - you remove the door at the left hand end of the QL and slide the TRUMP CARD into the expansion port. A "Beginners Guide" on pages 3 and 4 of the TRUMP CARD USER MANUAL will quickly get the novice and experienced user up and running.

TRUMP CARD 768K PACKAGE

£375 inc. (£333 export)

TRUMP CARD 768K + dual disk drive + 10 diskettes

This is the ideal upgrade path from obsolete Microdrives. The package comprises the latest TRUMP CARD 768K plus a QL standard floppy disk drive with 2 mechanisms plus ten 3.5" double-sided double-density diskettes. The only extra item required is the appropriate mains plug to suit the country where it is to be used.

Disks are more reliable than Microdrives, hold much more information (720K after formatting) and are several times faster. Besides these advantages they actually cost less. Our QL DUAL DISK DRIVE is fully boxed in a black metal casing and is mains (220V-240V AC) powered.

An EXPANDERAM 512K can be used as part payment against the TRUMP CARD 768K PACKAGE. Just send it to us together with £285 (£255 for overseas customers) remittance and we will send you the TRUMP CARD 768K PACKAGE.

This package transforms the unexpanded QL into a very powerful machine and is very easy to fit. We are confident that you will find this investment more than worthwhile as many QL users have already done so. If you are not fully satisfied with your purchase then by returning it to us within 14 days of receiving it we will return your money in full.

When ordering by phone it is sometimes easier to spell names and addresses using the phonetic alphabet

A - Alpha	H - Hotel	O - Oscar	V - Victor
B - Bravo	I - India	P - Papa	W - Whiskey
C - Charlie	J - Juliet	Q - Quebec	X - X-Ray
D - Delta	K - Kilo	R - Romeo	Y - Yankee
E - Echo	L - Lima	S - Sierra	Z - Zulu
F - Foxtrot	M - Mike	T - Tango	0 - Zero
G - Golf	N - November	U - Uniform	

MIRACLE SYSTEMS Ltd
25 Broughton Way,
Osbaldwick, York, YO1 3BG, U.K.
Tel: (0904) 423986

MIRACLE SYSTEMS

MASTERCARD VISA

14 day money back guarantee on all products
12 month warranty on all products
UK prices include VAT and P&P
(Export prices in brackets include P&P)

TRUMP CARD 256K
£135 (£120)

This is an ideal way to start expanding the bare QL for those who are not ready to purchase the full TRUMP CARD 768K. It comprises a disk interface, 256K of memory and utility software. The disk interface can control up to 2 double density drives. It can be made to control 4 drives by the addition of the DISK ADAPTER. The 256K memory adds to the QL's 128K giving a total of 384K. This memory is automatically installed at power-up such that QDOS cannot see the join. Programs running in the extra memory, eg Quill, run about 1.75 times faster. The memory can be upgraded to 512K or 768K by the addition of 8 or 16 memory chips of the type 41256. (Please note that we neither supply the chips nor do we do the upgrade.) The utility software includes TOOLKIT II, printer buffer, screen dump, RAM disk and memory cut.

NB Adding the DISK ADAPTER or extra memory chips will not increase the speed of this TRUMP CARD.

DISK CARD
£100 (£89)

This disk interface is intended for use with internally or externally expanded QLs. It can plug directly into the QL's expansion port or into the through connector on the EXPANDERAM. The circuitry is derived from the new TRUMP CARD 768K which can access up to 4 disk drives, and it includes TOOLKIT II, RAM disk, printer buffer, screen dump and memory cut software. There is no memory driver circuitry and memory cannot be fitted directly onto the DISK CARD.

DISK CARD PACKAGE
£250 (£224)

This package comprises a DISK CARD, a DUAL 3.5" DISK DRIVE, and 10 diskettes.

EXPANDERAM 512K
£99 (£88)

This card plugs into the QL's expansion port and increases the memory from 128K to 640K. QDOS recognises the extra memory during power-up so there is no need for the user to inform the QL that extra memory is installed. Programs run in the EXPANDERAM about 1.75 times faster than on an unexpanded QL. Quill users will not just see this speed increase but will also be spared the 'DEF_TMP' syndrome which occurs only on unexpanded QLs. A through connector is provided for connecting a disk interface such as our DISK CARD. The EXPANDERAM cannot be used with internal expansions or external memory like our TRUMP CARD since this would cause an address clash. Users wishing to upgrade to disks can use their EXPANDERAM 512K as part payment towards a TRUMP CARD 768K.

QL CENTRONICS
£29 (£28)

The simplest way to connect a parallel printer to the QL is by using this interface. It measures just 3" by 2" by 1" and plugs directly into the standard CENTRONICS port on the printer. Included is a 3 metre cable that plugs into either SER1 or SER2 on the QL. No setting up of the QL is required since the interface works at the QL's power-on default set-up of 9600 baud, 8 bit data, no parity and 2 stop bits. With two interfaces, two printers can be driven simultaneously - one from SER1 and the other from SER2.

TRUMP CARD 256K PACKAGE
£285 (£255)

This is all that's required to get disks up and running on the QL. The package consists of 3 things: the TRUMP CARD 256K, the DUAL 3.5" DISK DRIVE and 10 diskettes. The TRUMP CARD plugs into the QL's expansion socket and the DISK DRIVE plugs into the TRUMP CARD.

DISK ADAPTER
£15 (£15)

TRUMP CARDs purchased prior to March 1990 together with TRUMP CARD 256Ks use the original TRUMP CARD design which is able to access up to only 2 drives. However, the DISK ADAPTER contains a small amount of circuitry which allows access to be increased to 4 drives. It plugs into the disk drive socket on the TRUMP CARD and comes with a replacement ROM containing the latest version of TOOLKIT II. This is ideal for adding our QL 5.25" DISK DRIVE to a DUAL 3.5" DISK DRIVE system.

QL DUAL 3.5" DISK DRIVE
£175 (£155)

This is the drive supplied in the TRUMP and DISK CARD PACKAGEs. There are 2 mechanisms; each one is 3.5", 80 tracks per side, double sided, double density, with a formatted capacity of 720Kbyte per diskette. This defines the standard disk format for the QL and is probably more widely used than Microdrive cartridges. The key advantages that disks have over Microdrives are as follows:

a) the capacity is much greater
b) the speed is much higher
c) the media are much cheaper

Also 3.5" diskettes are widely available. The drive mechanisms are housed in a black metal case which also contains the mains power supply. The drive comes with the necessary cable to connect it with the disk interface. A disk interface such as our TRUMP or DISK CARD is needed to use it with the QL.

MIRACLE SYSTEMS

MASTERCARD VISA

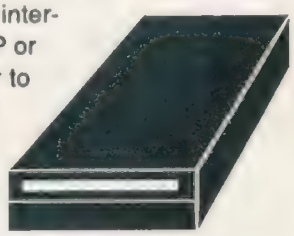
14 day money back guarantee on all products
12 month warranty on all products
UK prices include VAT and P&P
(Export prices in brackets include P&P)

QL 5.25" DISK DRIVE

(includes free DISK ADAPTER)

£95 (£88)

CONQUEROR and SOLUTION users will find this drive invaluable for loading PC compatible diskettes. It conforms to the standard PC format: 40 tracks per side, double sided, double density, and gives a formatted capacity of 360 Kbytes. The drive comes complete with a DISK ADAPTER so that nothing extra is needed to add it into a system with the old or new TRUMP CARD and DUAL 3.5" DISK DRIVE. Users upgrading from Microdrives are advised to consider our DUAL 3.5" DISK DRIVE as this is the standard disk system for the QL. The 5.25" DISK DRIVE requires a disk interface such as the TRUMP or DISK CARD in order to be connected to the QL.



QL HARD DISK £449 (£405)

40 Megabytes of on-line storage is what this is about. To cope with large numbers of files a new sub-directory system has been implemented. Accessing the HARD DISK is approximately 5 times the speed of a floppy. The HARD DISK uses about 55K so memory expansion is essential. Also it is highly recommended that the QL system has disk drives fitted such as our TRUMP CARD 768K PACKAGE so that the HARD DISK can easily be backed up. The HARD DISK plugs into the QL's ROM port and has a through connector for ROM cartridges.

Tel: (0904) 423986

To place an order by phone please have your credit card ready. For overseas customers we charge the prices shown in brackets.

To order by post, please fill in the form opposite or write to us quoting your credit card number and expiry date, or enclosing a cheque payable to MIRACLE SYSTEMS Ltd

To: MIRACLE SYSTEMS Ltd, 25 Broughton Way, Osbaldwick, York, YO1 3BG, U.K. Tel: (0904) 423986

Please send me _____

I enclose a cheque to the value of: £ _____

Or debit credit card ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

expires ☐☐/☐☐

Name _____ Signature _____

Address _____

SINCLAIR QL WORLD

THE NEW USER GUIDE

THE SCREEN

SECTION THREE

In the third of our New User Guide series, Mike Lloyd covers the subject matter of Chapter 3 of the *QL User Guide*.

The screen is an essential part of any computer system because it is where the computer communicates with the user. A great part of the operating system of the QL is devoted to managing the screen display. Similarly, a large percentage of Superbasic commands are used to produce images on the screen. This section of the *New User Guide* introduces everything you need to know in order to understand the way the QL handles the screen.

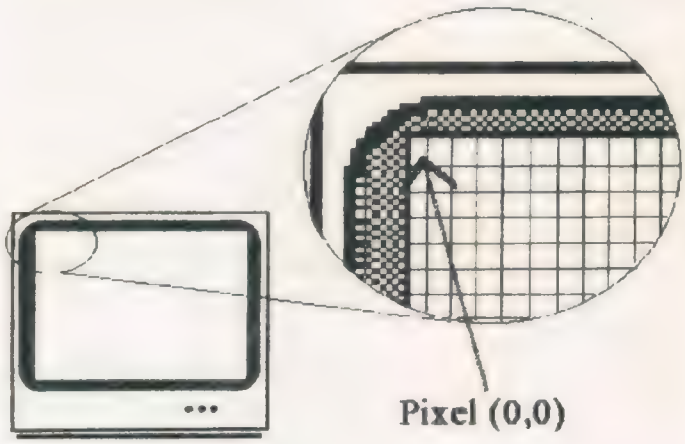
Pixels

Television pictures are made up of lines of dots, each dot called a 'picture element', or pixel. Modern television broadcast pictures produce high-quality pictures with 625 lines. Computers tend to have lower numbers of lines, typically around the 200-300 mark. The QL has 256 lines. Depending on the display mode each line has either 256 or 512 pixels.

The QL's designers allocated 32 kilobytes (32Kb of the computer's 128Kb memory to managing the screen. In high-resolution mode, or monitor mode, this memory limit means that each pixel can be one of four colours. The low-resolution, tv, mode has half as many pixels, allowing more information to be held for each pixel. Not only does the tv mode have eight colours, but the pixels can be individually set to flash.

The disadvantage of using tv mode is that vertical lines are twice as thick as they would appear in monitor mode. For television users the extra width of the characters can make text easier to read, but monitor users generally prefer to use the high-resolution screen mode in order to place more text and graphics on the screen.

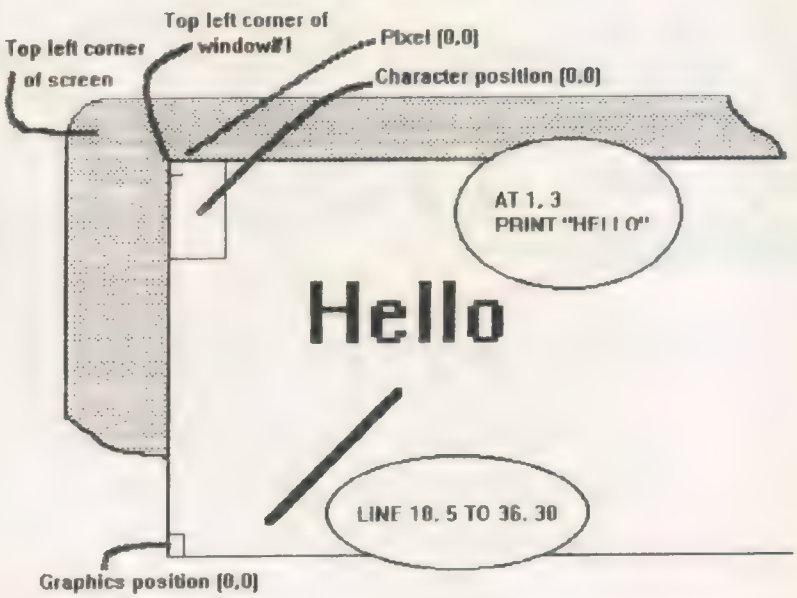
Figure 1: The screen-wide pixel co-ordinate system.



The grid

The computer screen is best imagined as a piece of electronic graph paper where each tiny screen can be painted with a given colour. The location of each square in the grid is described by counting how many squares across and down from the top left square it lies. Moving clockwise around the screen, the four corners are at pixel locations (0,0), (511,0), (511,255) and (0,225). The horizontal co-ordinate is given first.

Figure 2: the window co-ordinate systems



When a programmer issues a command such as PRINT "HELLO" the QL calculates where on the screen the letters must go. It then looks up in its operating system the details of what pattern of pixels forms each of the letters. The letter patterns are transferred to the correct place in the 32Kb memory area reserved for the 'screen map'. Fifty times a second this memory map is accessed by the QL in order to send the current screen picture to the tv set or monitor.

It is quite feasible, if a little unfriendly, for computer programmers to make changes to the contents of the screen map directly. It is much easier to use SuperBasic commands to specify where lines, curves and characters are to be drawn. With SuperBasic, the programmer tells the computer what is wanted and the QL then gets on with the task of fulfilling that request without the user needing to know how many pixels of what colours will be printed where.

It is very useful to be able to tell the QL exactly where on the screen text should appear – for example, to centre a heading or program name. Similarly, if we are going to use the QL to draw graphics there must be a way of specifying where lines start and finish. It would also be nice to be able to move windows around, and change their sizes, to meet the needs of particular programs.

In order to do any of these things, the computer's method of locating points on the screen must be used. The QL is more advanced than most other computers because the screen can be broken down into separate areas, called windows, each acting as if it was a screen by itself.

Windows

When the QL is turned on it has three screens windows opened automatically. These are called the default windows and are numbered 0, 1 and 2. Each has a specific purpose: Window 0 is the command window where your typing normally appears and where error messages are displayed: Window 1 is the default window where printed text output and graphics appear if no other window is specified, and Window 2 is the listing window for SuperBasic programs. Other windows can be opened using different numbers to identify them, but this will be covered later in the guide.

The size, position and colour of windows can be changed using simple SuperBasic commands. Window size and location are specified in pixels, and a typical command to specify a window's attributes is:

```
WINDOW 100, 100, 206, 78
```

WINDOW is a SuperBasic keyword. It is followed by four parameters separated by commas. The first pair describe the dimensions of the window and the next pair describe the location of the top-left corner of the window in relation to the top-left corner of the screen. The command can therefore be translated into English to read "Move the main window so that it is 100 pixels square with its top left pixel located 206 pixels across and 78 pixels down from the pixel in the top left corner of the screen".

You are already aware that the QL can increase the number of colours it can display by halving the number of pixels it draws. The QL's operating system is clever enough to ensure that a 100x100 pixel window stays the same size no matter what mode the screen is in. Always think of the screen as being a grid of 512x256 pixels, no matter what mode the computer is in.

A WINDOW command makes no immediate difference to what you can see on the screen. The computer has merely changed its understanding of where the window lies ready for the next

window-related command. To see where the window has moved to, change its colour so that it is different from the background and clear it with the CLS (clear screen) command introduced last month.

Ink and Paper

SuperBasic has two very easy commands to change screen colours. One changes the background colour and the other changes the foreground colour. Text and graphics are drawn in the foreground colour on pixels the colour of the background. The keyword must be followed by a parameter to indicate the required colour. The computer does not understand words such as blue, red and green, but it recognises colours by a number system, as follows:

TV MODE		MONITOR MODE	
Colour	**Number**	**Colour**	**Number**
Black	0	Black	0 or 1
Blue	1	Red	2 or 3
Red	2	Green	4 or 5
Magenta	3	White	6 or 7
Green	4		
Cyan	5		
Yellow	6		
White	7		

The PAPER command is identical to the INK command except that it controls the background colour of the window. The choice of colours and the numbers by which Superbasic identifies them are the same as for INK.

Colours can be described by any number between 0 and 255, even though the colour chart above suggests that the maximum colour value is 7. Numbers higher than 7 produce speckled effects which will be described in detail later in the Guide. Feel free to experiment, but be aware that the results can make text very difficult to read.

Here are a set of three commands which change the window location and colour it green:

```
WINDOW 80, 80, 100, 48
PAPER 4
CLS
```

Should you enter the above commands on your computer, you will notice that the window is not square, even though there are the height and width of the window are equal in terms of numbers of pixels. This is because pixels are not square but rectangular, being taller than they are wide. True squares can be made by specifying more horizontal pixels in the ratio of around 1.6:1, such as:

```
WINDOW 162, 100, 0, 0
```

Experiment with the WINDOW command to move the default window around the screen. If the QL detects an impossible window location it will print an explanatory error message.

All of the WINDOW, PRINT, PAPER and CLS commands used up to now have affected the main window, leaving the listing window and the command window unchanged. In order to direct such commands at other windows an identifying number is essential.

Channels

Communication between the computer and each window is by a 'channel'. Channels can be connected to many things, including windows, printers and files, and each channel is numbered. With the main window the identifier can be included or omitted as desired. As explained earlier, the command window at the bottom of the screen is WINDOW#0 and the listing window is WINDOW #2. The hash before the number indicates to the QL that it is a channel identifier and not a parameter.

All commands related to windows can be followed by a channel number. Thus, the PAPER command can be followed by a hashed number, such as PAPER 2, 4. PRINT is another window-related command which can be treated in the same way. Note though that if these commands take a hashed number there must be a comma between the window number and the first parameter. To demonstrate this principle, let us relocate and recolour the listing window and print some text in it:

```
WINDOW #2, 200, 200, 50, 10
```

```
PAPER #2, 5
PRINT #2, "This is the listing window"
```

The PAPER command will turn the window light blue, or cyan, if the QL is in tv mode, or the window will be green in Monitor mode.

MODE4 and 8

When the QL is first switched on the user must choose between tv mode and monitor mode. However, there is no reason why that mode must be used throughout the computing session. There is a SuperBasic command called MODE which takes a single number as its parameter. MODE 4 switches the QL into its high-resolution, four-colour mode most suited to monitors and MODE 8 provides the low-resolution, eight-colour mode which TV users most frequently use.

You should be beginning to see by now that SuperBasic is logical and simple way of expressing things. Commands are made up of keywords and, optionally, parameters. Most of the parameters used so far have been numbers, but the PRINT command can be followed by a text parameter enclosed in inverted commas. Although it might be difficult for programmers to remember, it is convenient for the computer to recognise things such as colours and channels by numbers rather than by names.

At the beginning of this section of the User Guide we learnt about the screen-wide pixel co-ordinate system used to locate windows. Each window has its own co-ordinate system with its pixels described as offsets from the top left corner of the particular window they belong to. This is very rarely used by SuperBasic commands.

There is a more useful co-ordinate system linked to each window which determines where text is placed. Like the pixel co-orindates the origin – the point described as (0,0) – is at the top left of the window. However, each location on the grid is exactly large enough to hold a single character. This is a very convenient arrangement because the QL has six different text sizes: the character co-ordinate system adjusts itself automatically to suit the current character size chosen.

The AT command

Character co-ordinates are described by the AT command. AT is always followed by two parameters to represent the horizontal and vertical offset from the top left character in the window. Thus:

```
AT 5, 6
PRINT "HELLO"
```

will print the word HELLO beginning at a character position five lines down and six places in from the top left corner of the window. Because AT is a window-related command you would expect it to be able to take a channel number, and so it does. AT 2, 4, 2 will affect the print location of the next text printed in the listing window with the PRINT 2 command.

There is yet another co-ordinate system linked to windows to control the drawing of graphics such as lines, curves and circles. This is known as the graphics co-ordinate system. It is particularly clever because it changes its scale so that no matter what the size of the window its height always equals 100 graphic units. Another invaluable feature is that a circle drawn in monitor mode can be re-drawn exactly the same size in tv mode, even though there are a different number of pixels and each pixel is a different shape. The origin of the graphics co-ordinate system is at the *bottom* left of the window.

To experiment with the graphics capabilities of the QL there are two commands which will be fully explained in the next section of the Guide.

Line and Circle

Lines are drawn using the LINE command. Four parameters are needed: two to describe the location of the start of the line and two to describe where it will end. A new keyword, TO, separates them. Two examples are:

```
LINE 20, 40 TO 20, 80

LINE 10, 90 to 50, 30
```

Circles are drawn by the CIRCLE command. The CIRCLE keyword takes three parameters: two to describe the location of the centre of the circle and the third identifying its radius in graphics units. Remembering that no matter what shape and size a window is it is always 100 graphics units high, a circle touching the top and bottom of the window can be drawn by the command.

```
CIRCLE 50, 50, 50
```

NOTICE BOARD

QL WORLD AT THE FAIR

Bill Richardson of EEC Ltd has agreed to act as a subscription agent for QL World at computing fairs where EEC are appearing. Bill already distributes samples to new QL owners buying through EEC and has been active in spreading the word to new users, putting together hardware packages and campaigning for the conservation of the microdrive.

EMULATORS

QL World would like to hear from anyone who is using the QL/Atari ST or the QL/Amiga emulator software,particularly from anyone who would like to write a report on the uses and benefits thereof. Please send a brief summary of your experiences for the Editor's attention.

PRINTER REPORT

Do you get on with your printer? Has the relationship been smooth or stormy? QL World would like to hear from users who have bought new printers within the last two years. Could you report your successes and failures to other readers? Write to the Editor for details, stating printer type and model.

PRINTER HELP REGISTER

Clever printer owners – happy printer owners – printer owners who are in control of your lives. . . Would you help a frantic printer-owner if we asked you? Postal only, via the QL World office, authors' fee for publishable solutions. Offers and enquiries to the Editor, please.

SOFTWARE FILE

DB Easy

DBEasy provides a user-friendly interface with Archive. Bryan Davies tries it out.

INFORMATION

Program: *DBEasy V1.2*

Price: see comments

Supplier: Wood and Wind Computing, Bill Cable, RR3, Box 92, Cornish, New Hampshire 03745, USA.

Tel. (0101)-603-675-2218

Archive is the type of program which is easily neglected, because it requires a fair amount of time and attention to be devoted to it before satisfactory results are obtained. It is no *Quill*; you cannot be familiar with most of it after one half-hour session. That does not make it worthless; far from it. What is almost essential, though, is some study of the programming language provided with it. Judging from personal experience, and the letters we have seen over the years, many users are either unable, or unwilling, to make use of this language, and the Archive cartridge tends to sit, unused, in its pouch.

Lists

The desire to put a database onto the QL doesn't disappear with Archive, however. It is characteristic of people who use micros that they like to keep lists. Many users presumably fail to realise the potential of word-processing programs for keeping lists, and hanker after some way of being able to utilise the power of Archive without having to learn a language. In some respects, *Flashback* allows such users to make their lists relatively painlessly, but it does lack the power of Archive, in so far as it has no built-in programming language, and that means it is not fully satisfactory for some users. The introductory notes supplied with *DBEasy* state that the program's aim is to enable users to have some of the power of the Archive language available to them, without the pain of writing routines themselves. That is, DBEasy was written to provide a user-friendly interface with Archive.

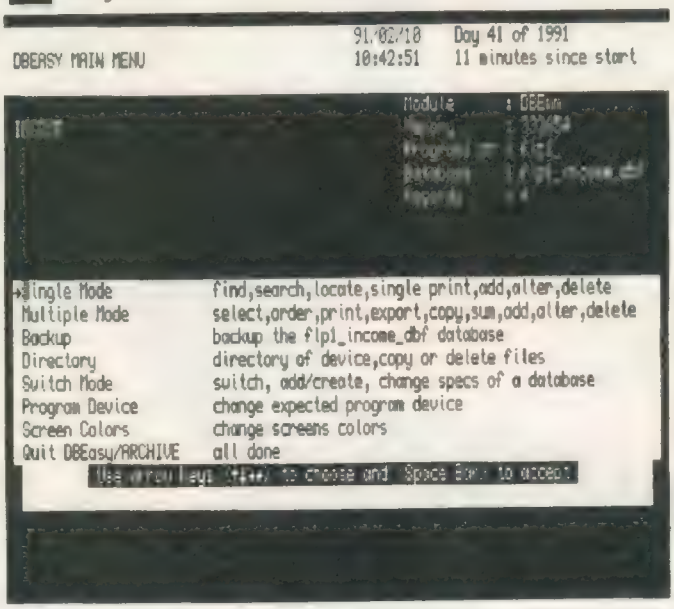


Figure one: the DBEasy main menu screen.

Before going into the details of the program, it should be pointed out that the review copy (version 1.2) was received some time ago, and became a victim of the problems suffered by *QL World* in 1990, so there may be a later version available. The price quoted for the program when the review copy was supplied was £23.95 on 5¼in disk and £25.95 on microdrive cartridge, but it is advisable to check on current prices before ordering. The purchaser should specify whether the program is needed for a basic, or expanded-memory, QL. The F2 (tv) screen mode is not usable with either version. The review copy was the floppy disk, expanded memory, version. You are warned in the instructions that some operations may require the loading of program modules from the program device, and this may involve the swapping of cartridges if the QL has no memory expansion.

The nine pages of instructions on A4 paper are easy to read and understand. The first two pages contain a brief explanation of database structure, and a description of how a DBEasy record is structured. Sensibly, the point is made that it is useful to keep text and numeric quantities separate on a record, but that various forms of nominally-numeric quantity are best treated as though they are text. The examples given are the numbers on bank cheques, and postal codes. While both are wholly or partially numeric, neither is subject to any calculations and they are, effectively, no different to alphabetic text data.

The DBEasy record has 10 lines for text field data, with up to 63 characters in each field, and a further six fields for numeric data. The user inserts field names as desired; there is no requirement to give names to all, or any, fields. Any characters on your keyboard can be used in a field name, up to 12 characters maximum, and names can be changed at any time. There are two additional fields, which cannot be named by the user; one is for the date (when the record is created), unless the user chooses to use it for something else, and the other — called 'Keys' — is for specifying a category (or categories) into which the record falls. For example, a name and address database might have the categories 'QL user', 'friend', and 'supplier'. Since field names can contain characters that are outside the range which is standard to most printers, the user may have to run the Psion INSTALL_BAS routine to alter the PRINTER_DAT file and insert translations which tell the printer how to handle any 'odd' characters.

Options

Once the chore of typing-in records has been carried out, DBEasy makes life easier; information can be displayed on the screen or sent to the printer, numeric fields can be summed

on the screen or in the printout, and data can be exported to *Abacus, Quill or Easel*.

The program boots up with an initial date and time checking/setting routine. You are advised to have the Archive program file ready in a drive; to save time, it would be on the same disk as DBEasy, but DBEasy expects to start Archive from its own boot file and will re-boot itself if you don't either rename the initial boot or alter the line in it which calls Archive (to get rid of the unnecessary Archive boot). Although the proffered device names are

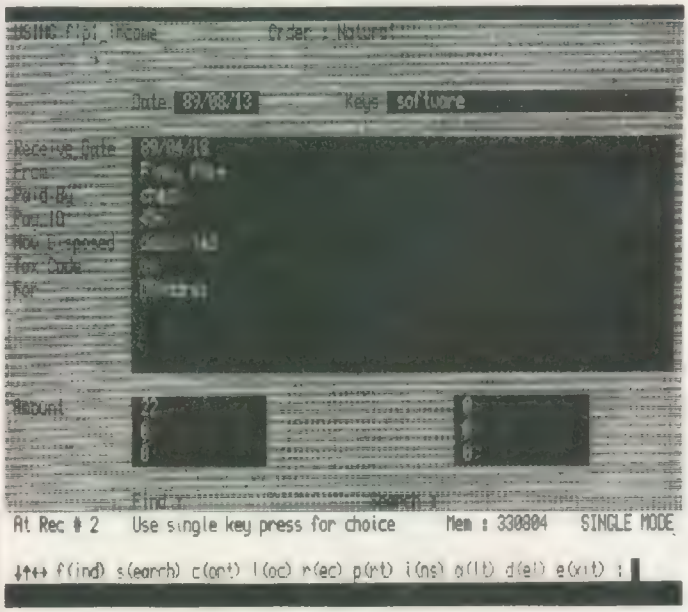


Figure two: the main database screen.

the usual ram, flp and mdv, there is an 'Other' option, so that you can enter wini_etc if desired.

Once Archive is running, you key in RUN 'flp_DBEasy', and the program starts. The screen displays a brief running commentary of what is going on — a good idea when the loading procedure takes more than a few seconds. A log is kept, showing both the names of all the defined databases and that of the database file last used; the program checks this log and loads that file, if possible. The screen display when such a file has been loaded is shown in **Figure one**. The displayed menu covers the main requirements for a complete work session, allowing database functions, some re-configuration, and housekeeping operations. A single-character cursor with a marker arrow to its left is moved to the desired option with the up/down cursor keys, then the option is selected by pressing the Space bar.

Commenting on the menu options in their order, Single Mode provides the familiar Archive functions Find, Search, Locate, Alter, Delete, plus two others, Single Print and Add. Choosing this option brings up the main database screen, as shown in **Figure two.** The actual options on this screen are named somewhat differently from those listed for Single Mode, but they are fairly self-explanatory. There is no facility to step forward and backward within a database, which seems a rather surprising omission. You *can* move to a specified Record Number.

As is normal in Archive, Locate is the fastest searching function, but it works only for the first ordered field, and the file has to be Ordered for it to work; this search method is case — sensitive. Find is the slowest operator, and looks for any specified string, anywhere within the text fields of all records. It is stated to operate in the case-significant mode, but it appeared to ignore case (as one would expect from the Archive definition of it).

Search matches a specified string within a particular text or numeric field. Selection of Search is followed by quite comprehensive sets of choices of qualifiers, including Yes/No/Exit for 'Ignore upper/lower case'. **Figure three** shows how a Search operation is specified, the selected qualifiers being marked by arrows. The field 'From' and string 'Fi' have been selected, the 'Containing' qualifier indicates that the string should appear (anywhere) in the field, and the 'No' qualifier specifies that the search should be for the typed-in case of both string characters. The selected record in this case was the one shown in Figure two.

Commands

Insert, Alter and Delete use the basic Archive procedures; Insert is what was called Add on the prior menu. Confirmation is requested before a deletion is carried out. If there are further records having the specified string, they will be displayed when Continue is selected. Where the Record Number of a desired record is known, it can be displayed by means of the Record option. When Print (Single Print, on the prior menu) is selected, you have the option of printing the whole record, a single line, or a label. The whole record is essentially what is shown on the screen, minus the command and status information. The 'Line' option prints a single line, containing basic information from the current record; in the case of the record shown in figure two all that is printed is:

2 (Record hash) Fink, M (From) DBAddres (For) 22 (Amount)

The field names in brackets here are not printed out. The Label option applies only to a name and address database, and prints at the left margin, which might be too far left for label stationery, and wouldn't look too smart printed directly on an envelope.

Multiple Mode displays up to 10 records on the screen simultaneously, in an abbreviated, line-per-record style, as shown in **figure four.** There are several options on the sub-menu displayed in this mode. In the illustration, Order has been marked for selection. To Page is used to list other records if there are more than the 10 which can be displayed on the screen simultaneously. Select has a sub-menu of five options. You can select on any of the entries in the key field for example, "QL" in the name and address database. You can select by field, or by the occurrence of a specified string within a record. Include/Exclude options are offered once the selection has been made.

A large database file could be 'refined' in this way, so that only a small section of the records is displayed. Reset makes all files current again after Select has excluded some of them. Single changes operations back to Single Mode. Copy allows any database file to be copied; that is, another file with a different name can be created, having exactly the same contents as the one from which the copy is made. This is useful for the initial creation of a backup file. Chg Dis allows the user to alter the way in which records are displayed, by changing any or all of the three fields listed; the option is given to make the change(s) temporary or permanent. Order is the Archive function to place records in order, so that the Locate function may be used with them. You can order the database on up to three fields, in ascending or descending order. Sum is only valid if there are numeric fields in the database; provided a numeric field has a label (field name), the contents can be summed. Prt Rec, Prt Lin, and Prt Lbl are print options, for the complete record, a single line record summary, or an envelope label. The printout can be given a heading; a particular sequence of records to be printed can be specified; the number of lines per record can be specified (to alter record spacing), and printer, screen or file can be selected as the output device.

Printing

Printing to a file creates a file suitable for Import into Quill. **Figure five** shows the screen with all selections made for printing to the screen. Insert, Alter and Delete are the normal Archive commands. Quit allows DBEasy to be closed down, whereas Exit (an option on several sub-menus) merely takes the user back to the previous screen. Export is the option for producing a file to be Imported into Abacus. Files produced this way appeared to be Import-able without difficulty into Abacus; as is normal with this program, Import-

ed files lose their (text and numeric) field names, but you can easily insert the correct names in place of the ones Abacus invents.

Backup allows the current database to be backed-up to a different device. The user can opt to have the device formatted automatically before the backup copy is made. A name containing the number of the day of the year is offered for the backup copy, allowing you to pick a particular backup from a set if corruption or another factor necessitates re-use of an old database version.

Unlike some major QL programs, the Psion quartet permit a limited amount of housekeeping activity to be performed from within the programs themselves. The Backup option just described is one such activity, and the Directory option adds both a directory listing (of any of the available devices) and Copy or Delete to this. The directory lists all files, regardless of type, and uses most of the screen, printing the files in columns to make it unlikely there is any overflow; it gives the total and available space on the medium. A small box presents the options to Copy or Delete any of the listed files, singly. Very simple and straightforward — it's a pity some other suppliers can't incorporate this kind of thing into their programs.

Display

Choosing Switch Mode produces a display of all the database files in the log. A sub-menu offers the options Use, Print, To Page, Add, Change, Remove and Clone. Use enables the current database to be replaced by any of the others listed; this is a two-stage process, as the replacement database is initially only marked on the log (you might want to use some of the other options with it), and you have to Exit to make it the active database. The Print option sends a copy of the record format for each of the databases in the log to the printer. Once the log contains too many files to be displayed on the screen simultaneously, the To Page option has to be used, to access those files which are not currently displayed.

When a new database is to be created, the Add option is chosen. This presents the blank record screen and guides the user step-by-step through the process of inserting details of the new database. Change allows the user to select a database record format and make changes to the field names. A database can be removed from the log with the Remove option; this action has to be confirmed, and does not result in the deletion of the database itself. A copy of a database can be made with Clone. The record screen for the chosen database is displayed, and the user is invited to make changes to the record format, which will be useful when it is necessary to create additional databases which differ only in detail from an existing one.

As might be expected, the Program Device option allows you to change the default program device. It does a little more than this, though; after the new device has been specified, you are presented with a directory of it and asked whether or not the program files are currently on it. If the files *are* on it, you are asked to confirm that the change should be made permanent (ie the appropriate file has the change written to it) but, if the files are not there, the option becomes invalid.

Screen Colors allows the user to set Ink and Paper in both the heading area and the main work area. The program operates in Mode 4, so the colour choices are red, green, white and black. Quit DBEasy/ARCHIVE offers the choice of leaving just the DBEasy routines, or closing down Archive as well.

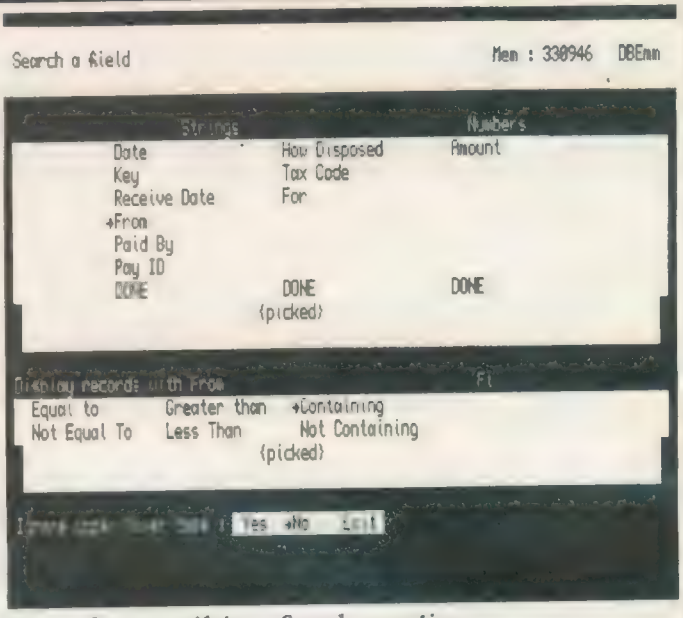


Figure three: specifying a Search operation.

Four sample database files are supplied (one is shown in the illustrations). They are sufficient to give even an inexperienced user a fair idea of how to go about setting-up a database. Since it is quite easy to change field names and other details, the samples could be used as the basis for the user's own databases. The DBEasy routines can be inspected and altered, as with any other Archive Procedures. The supplier suggests the user might want to customise the routines to obtain printouts and calculations to meet specific personal requirements.

Numeric fields can be summed. If more-complicated mathematical manipulation is required, the database should be exported to Abacus. The supplier suggests one possible use of DBEasy is the keeping of complicated book-keeping records, because of the facility to make use of Abacus for calculations.

Memory

Archive and QL memory place restrictions on the number of records one can have in a database. It is pointed out that the later version of Archive (2.35) permits the use of more records than do the earlier versions. Ordering reduces the number of records allowed. Where lack of memory is the limiter, you are advised to split databases into two parts (when the displayed memory value drops to about 1000 bytes). The Multiple Mode option allows the user to select a portion of the current file and copy it to a new file; do this with the two portions of the current file, then use these and abandon the original complete file.

Users of Archive may well develop something of a phobia about the command OPEN, having experience its failure following field corruption. DBEasy tries to minimise the possibility of corruption by keeping the current database file closed most of the time, and opening it only when the Insert, Alter, Delete or Order commands are in use. Backup of databases is an essential action, and is made straightforward by the Backup menu command.

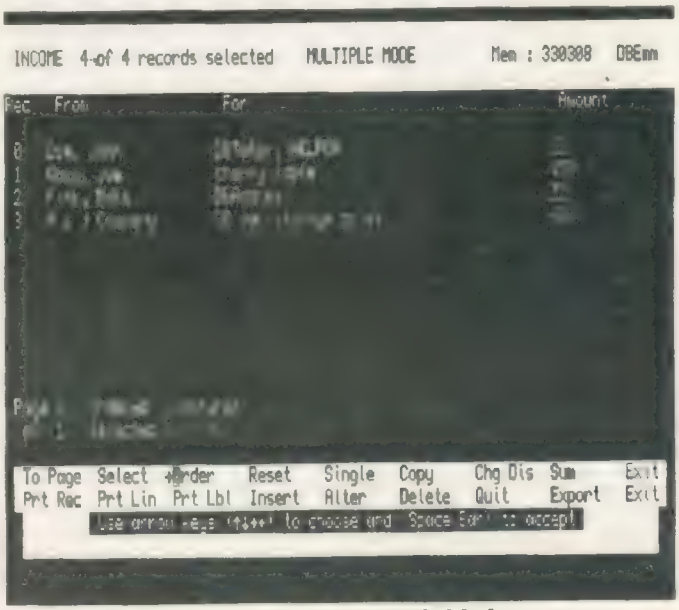


Figure four: record summary in Multiple Mode.

On the negative side, the program does not operate in a way one would call fast, although the speed may well be acceptable for the kind of work it is likely to be put to. It wouldn't be difficult for a user with even limited knowledge of SuperBasic to modify the boot and program files and arrange for files to be loaded into ram and used from there, which would improve speed of operation. There are several useful touches, such as the display of current activity during loading, available memory, date, number of records, database file name, current Archive routine name, default device name, etc.

Different

Sub-menus offer options which are sometimes worded slightly differently from the way they are on the main menu; this shouldn't cause much trouble, once the user has had some practise.

There is some inconsistency in the required manner of (menu) input from the user.

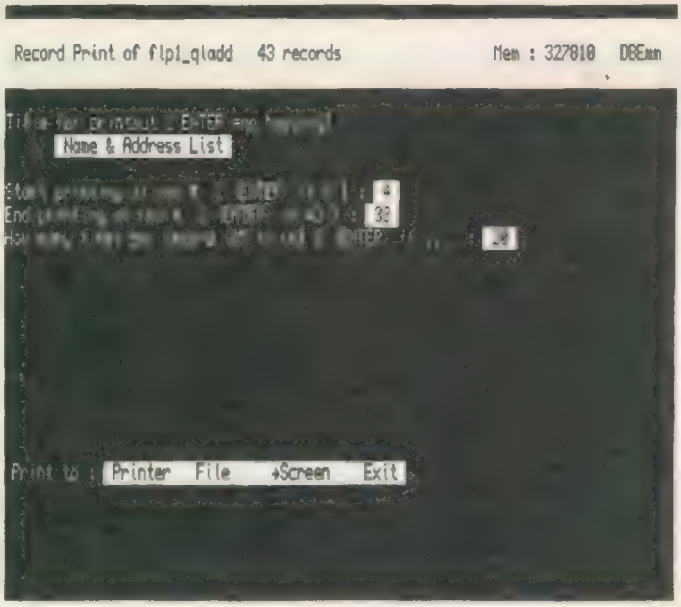


Figure five: a rile ready to print to screen.

Most of the input is in the form of single keypresses, but these sometimes have to be followed by ENTER, sometimes not. Likewise, some menus require the cursor to be moved by the cursor keys, then the Space bar to be pressed for selection of options, whereas others are content with the first letter of the option being pressed. Some flexibility is incorporated in the main menu by the facility to specify how many lines you want to move, before hitting the cursor key. For example, to move from the first line (Single Mode), to the last (Quit DBEasy/ARCHIVE), you can hit 7, then down-arrow. You could also hit up-arrow once, which would be faster.

Slow

The program is far from expensive, and it is clear that the programmer gave a lot of thought to what is needed to make Archive more approachable for less-experienced users. It achieves its purpose of making Archive more user-friendly, and it is rather more 'professional' than most other programs in this price and purpose category that I have looked at. The failings are mostly of a detail nature, and not such as to seriously mar the program for most users. The lack of speed would be a drawback for anyone wanting to use the program for work which needs to be done in a hurry, but should not prove a problem for the typical home user, with maybe a small club database to keep in order.

KEN BAKER SOFTWARE

32 Hunts Pond Road – Park Gate – Southampton – SO3 6QA – 0489 581056

All Programs for 768K Expanded QL with Trumpcard

SPEEDSORT
The ultimate sorter! Sorts arrays of any size by given element number. The speed is devastating – up to 80,000 sorts per second!
Machine Code £20.00

QLDL
QL Disk Library allows the user to catalogue up to 3000 program titles (around 75 disks at a time) in alphabetical order and cross-referenced by numbers given to the disks. No more searching for endless hours for that lost program.
Machine Code £15.00

SCREENMASTER
Screenmaster will record anything currently on screen in a 'squeezed' form, and reproduce the picture in a variety of cinematographic-style wipes and speeds.
Machine Code £20.00

PLANNER
One of the most useful programs you could wish for. It will provide a printout of dates, with day and week numbers, in a month-per-page format from a given starting date and number of forward days. It also includes routines for finding day and week numbers you can use in your own programs.
Machine Code £10.00

TRANQUIL
Tranquil converts Quill documents into BASIC PRINT statement form in order that they can be more easily manipulated for printing and adding printer instructions etc.
Machine Code £10.00

ALL PROGRAMS SUPPLIED ON TOP-QUALITY 3½ INCH DISKS – POSTAGE & PACKING FREE

SOFTWARE FILE

QL Cocktails Waiter

Pleasure or perdition? John Shaw has the receipe

Picture the scene: the soft music is on, the curtains are pulled, and the room is only lit by the warm glow of your trusty QL. "I'll make you a cocktail, darling", you murmur romantically. "What are your favourite drinks?"

"Oh! I love apricot brandy, Dry Vermouth and gin. Can you make up one from that?", she replies.

You go over to your QL, already programmed with *Cocktails Waiter*, press selection 5, enter the ingredients and casually take a glass from your cabinet.

You turn and see that you have a selection of eleven drinks... Abbey Bells, Claridge, Lutkins Special... no, here we are. You quickly mix one part apricot brandy, one part dry Vermouth, two parts gin, one dash of lemon juice and four dashes of Grenadine.

"It is called 'English Rose', my darling and may I say how appropriate it is. . .". Clearly the night is made for love!

For the less romantic, Imre Dominik has produced program providing over 400 recipes for various drinks cocktails. It is implemented as a Runtime Archive application program which provides comprehensive printing, viewing, searching and selection of drinks recipes.

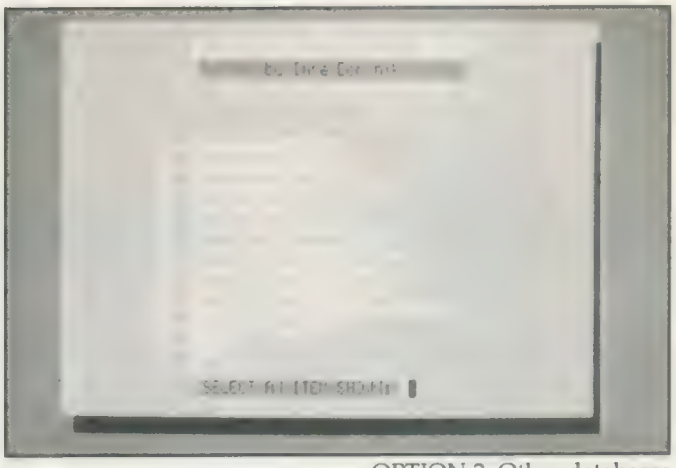
The instruction sheet is simple to follow and contains all the necessary directions on how to make a backup and get the program running.

INFORMATION

Program: *QL Cocktails Waiter* by Imre Dominik.

Supplier: Dilwyn Jones Computing, 41 Bro Emrys, Tal-y-Bont, Bangor, Gwynedd.

Price: £10.00: Extra recipe sets (500 in each) £5.00. Available on microdrive, 3.5in or 5.25in disk. Needs 128K expansion to run.



A few moments after BOOTing up you are confronted with the main menu. This tells you that the database file (mix 1) is loaded and that there are 410 records in the memory.

In addition you also have 11 options:

1. Create a new list
2. Open another file
3. View/alter existing list
4. Add new cocktails
5. What can I make with...
6. Describe this cocktail...
7. Select by word/phrase
8. Reset the SELECT file

L. List all available cocktails
P. Paper printout
Q. Quit

OPTION 1 allows you to create a new database for your own purposes, such as cooking recipes or details of a record collection.

OPTION 2. Other databases containing 3-400 recipes are available at a cost of £5.00 each. This option allows them to be brought into use.

OPTION 3 is the main tool for displaying the list and moving, sorting, altering, finding and deleting your cocktails. It is a menu driven screen with a single keypress entry facility.

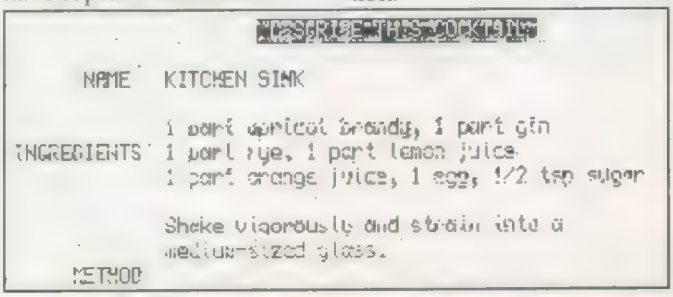
OPTION 4 will allow you to enter new cocktails of your own invention or just some you may have copied from a book.

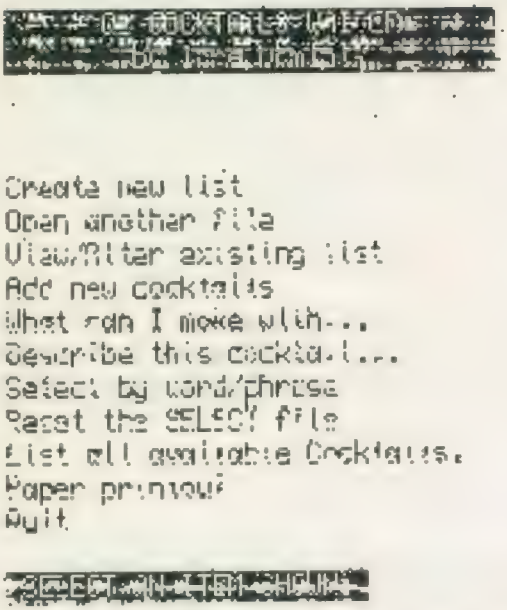
OPTION 5 is a particularly useful option. You can enter up to five ingredients which you have in your cocktail cabinet and the program will search out all those recipes which contain the specified drinks. You can then either page through them individually on the screen or print them out. On leaving this option the file will have to be reset (OPTION 8).

OPTION 6 enables you to enter the name or part name of a cocktail and the database is searched. For example if you enter the word 'Lady', you will have 5 cocktails displayed; Apricot Lady, Lady Brown, Lady's Crusta, Pink Lady and White Lady.

OPTION 7 allows you to select by a word or phrase. For example if you want only those cocktails to be displayed which don't involve shaking, then you just choose the word 'Stir' and those cocktails will be selected from the rest.

OPTION 8 is the RESET option.





BOSOM CARESSER

1 part Curacao, 2 parts brandy
1 tsp grenadine
1 egg white
Shake vigorously and strain into a medium-sized glass.

OPTION L will give you a complete list of all the cocktails on the database either printed in four column mode or displayed to the screen.

OPTION P. Here you can print out the whole of the cocktail list, recipes and all. But beware: at the rate of four cocktails per page you will need at least one hundred sheets of A4 ready.

So, here we have a very well written program, set on an adaptable database which does its job quickly and efficiently. For £10.000 it is good value for money.

Finally, my wife and I decided to test the cocktail barman at our local hotel.

"Shout out any two numbers between 1 and 410", I said to my wife. 62 and 407", came her swift reply.

"OK, Barman", I said, running my finger down the complete printout list," My wife would like a. . . 'Bosom Caresser' and I'll have a. . . 'Young Man'".

Duck . . .

"Ladies first, Ducks!", said the Barman, as he leaped the counter.

YOUNG MAN

3 parts brandy, 1 part sweet vermouth
2 dashes of Curacao
1 dash of Angostura bitters
Shake well and strain into a cocktail glass.
Serve with an olive or a cherry.

CARE ELECTRONICS

QL SUPERTOOL KIT II by Tony Tebby

Over 118 Commands:- Full Screen Editor, Key Define Print Using, Last Line Recall, Altkey, Job Control, File Handling, Default Directories, Extended Network,
16k Eprom Cartridge Version ..... @£24.15d
Configurable Version on Microdrive ..... @£24.15d

MIRACLE SYSTEMS PRODUCTS

OK Disc Interface (Inc Tool Kit II) ..... @£99.82b
QL Centronics Printer Interface ..... @£28.75d
QL Expanderam 512K Thrucard ..... @£99.99e

QL HARDWARE

Single 3.5" Disc Drive & (Own PSU) ..... @£103.50a
Dual 3.5" Disc Drive & (Own PSU) ..... @£172.50a
3.5" DS DD Discs - 10 off ..... @£9.20c
QL Keyboard Membrane ..... @£11.50d
QEP III Advanced Eprom Programmer ..... @£121.90d
Care Eprom Cartridges each ..... @5.75c
ULA CHip ZX8301 ..... @£15.64c

SOFTWARE 87 (State MDV or Disc)

TEXT87V.300 (Requires Min 256k) ..... @£60.00d
FOUNTED 89 ..... @£15.00c
FOUNTEXT 88 ..... @£25.00c
TEXT 87/FOUNTED 89/FOUNTEXT 88 ..... @94.99b
248B PRINTER DRIVER ..... @£15.00c
Upgrade to Text 87 V.3.00. Return old copy together with ..... @£25.00d

MONITORS (Price including lead)

Philips CM8833 Colour Med-Res ..... @£253.00a
Philips BM7502 Green Hi-Res £97.76a

TONY TEBBY SOFTWARE (QJUMP)

QLFP (Micro/P disk interface upgrade) ..... @£14.95d
QTYP Type/Spell Checker ..... @£29.90d
QPAC 1-Desk top accessories, calander, alarm, calculator, typewriter, digital clock sysmon ..... @£21.85d

2TASOFT SOFTWARE by Steve Jones

LOCKSMITHE copies M/DRIVE - M/DRIVE .... @£14.95c
4MATTER + LOCKSMITHE copies M/DRIVE - DISC ..... @£23.00c
SIDEWINDER - High resolution printer driver prints full screens or parts of screens from postage stamp size to large banners. Prints sideways, invert, scale, mirror, text insertion ..... @£19.95c
SIDEWINDER PLUS - (for expanded QL's) includes all the features of above, PLUS multiple label printing, desktop publishing files and printer driver for 24" pin pluspinters LC10 and Jx80 colour printers. (Please state 3.5" disc or MD) ..... @£23.00c
Upgrade to Sidewinder Plus ..... @£8.05c

HEAT TRANSFER RIBBONS & PENS

Print your own T-shirt Design. Just print on paper and iron onto your T-shirt.
Star LC10NX1000, Rainbow ..... @£17.25c
Star LC10NX1000, Black ..... @£11.50c
Epson FX80, MX80, LX80, FX100/Okidata ML80 Citizen 120D/Star NX10, Black, Panasonic 1080/81 ... @£11.50c
Small 5 colour pen set ..... @£13.80c
Jumbo 5 Colour Pen Set ..... @£17.25c

READYMADE LEADS

RGB QL to Phono ..... @£5.75c
RGB 8-6 pin DIN ..... @£7.13c
RGB 8-7 pin DIN (Hitachi) ..... @£7.13c
RGB 8-7 pin DIN (Ferguson) ..... @£7.13c
RGB 8 pin to SCART (Euro) ..... @£11.50c
6-way PCC 25-way 'D' (Printer-Ser 1) ..... @£9.89c

QPAC II

QPAC II Main menu windows adjust automatically to size. Files, directory, view, print, delete, backup, jobs, pick, Rjob, sort, channels, things exec, wake, buttons, Hotkey, Hotjobs. Fully multitasking, allows many programs to run at once. Requires min of 256k expanded memory ..... @£49.91b
Upgrade QRAM to QPAC II return master ..... @£29.90b

AS REVIEWED QL WORLD AUGUST ISSUE

QPOWER REGULATOR

Switch mode power supply, QL runs cool. Stops, Lock ups (due to voltage drop) Helps filter noise out. Simple to fit (no soldering) £24.15c

AREOSAL KEYBOARD LUBRICANT

Stop those sticking keys, give your keyboard a new lease of life only £2.95c

OPEN
9am-5pm Mon-Thu
9am-4pm Fri

CARE ELECTRONICS
800 ST ALBANS ROAD, GARSTON, WATFORD, HERTS, WD2 6NL.
Tel: 0923-672102
Fax: 0923-662304

Please add carriage
a=£11.50 b=£3.45
c=£1.38 d=2.30

HOW TO ORDER:

PLEASE NOTE THAT DUE TO CHANGES IN VAT ALL PRICES WILL BE SUBJECT TO 2.5% INCREASE

By Post. Enclose your Cheque/PO made payable to CARE Electronics or use ACCESS/VISA. Allow 7 days for delivery

TF Services

QuaLsoft Terminal

Vloeidata/VT52/VT100 QL TERMINAL EMULATOR

'Een deluxe communicatieprogramma van Kwalsoft'

Multitasking for electronic mail, PRESTEL etc, CET download. Phone directories for ALL (yes ALL) modems for the QL, autodial (where poss) and logon, two-way FILE TRANSFER to ATARI ST, IBM PC, Psion Organiser (via comms link), XMODEM, real time clock/timer, buffered logs to file/printer transmit files, editable command line, Swedish, Norvgn/German options, translates, editor etc.

SOLVES ALL PACKAGED "CODE" SOFTWARE PROBLEMS

Unbuffered modems usable with Miracle Modaptor

Software (3.5" or mdv) & manual £30

QL SPARES

Faulty QL boards (excl plug in ICs)..... £9
Keyboard membrane... £7 Circuit diags... £2
68008 cpu..... £8 1327 PAL..... £3
JM rom set..... £12 Power supply... £12
8302 ULA..... £10 8301 ULA..... £10
8049..... £7.50 MDV ULA..... £12
Other components (sockets etc ... price PHONE

BULLETIN BOARD

QABS - UK's first QL scrolling board

QL Echomail around Europe, and FIDO netmail

Around 10mb of files including the WHOLE King James bible!

071-706 2379 V21/23/22/22bis 24hrs

COMPUTER CLEANER

HELP STOP POWER SUPPLY INDUCED LOCK-UPS AND PROTECT COMPUTERS

Much improved mains filters. 40-50 db cut

Contain inductance, spike filter (three 3 & 4 way) and certified 240v ac input fuse.

2-way (5a adaptor)... ..... £14
3-way (5a adaptor)..... £18
4-way (13a trailing socket)..... £24

FILE TRANSFER

Programs to transfer text AND programs error free (XMODEM) between computers

Available for IBM PC and compatibles, ATARI ST and Sinclair QL. Connects to Psion organiser via Psion comms link

QuaLsoft program (per m/c £7.50
Serial lead (name 2 computers)... £10
Complete package for 2 computers. £25

QL REPAIRS

QLs tested with Thorn EMI test rig and ROM software

(MDV hardware extra if required)

£25 - 6 month guarantee

All prices include VAT and postage in the UK

MAIL ORDER ONLY

12 Bouverie Place, London W2 1RB Tel: 071-724 4951

SCROLLING BBS FOR ORDERING/QL HELP - 071-706 2379 - 4 speeds to 16.8

Fax: 071-706 2379 Telex: 265451 (ref: 72:MAG00645 Prestel: 01724905

sinclair QL

EEC LTD MAIN SUPPLIER OF Sinclair QL COMPUTERS & PRINTERS QLs FROM £125 PRINTERS FROM £130 inc VAT

The expandable system for small businesses, beginners, and experts

QLs COMPLETE JM ROM FULLY TESTED AND WITH 6 MONTHS WARRANTY

Package includes PSU TV lead, QL Software 2.35, Quill - Word Processor, Abacus - Spread Sheet, Archive - Records, Easel - Business Graphics £125

Customers buying one of the QL Computers are given one year's **free membership to QUANTA** (Help, Newsletters, & 400+ Library of Programs - mostly free!)

QUANTA MEMBERS can obtain a £5 discount

As above but fitted with JS ROM £150

★ SPECIAL ITEMS ★

MANNESMANN TALLY MT81 9 PIN DOT MATRIX PRINTER CENTRONICS (QL needs I/Face £20 extra) £130

Epson FX 80 type & PC compatible. Draft 130 cps. NLQ 24 cps sheet and tractor feed

QL Centronics interface £20 if bought with printer £20

Interchangeable plug-in interface modules for star NL-10 printer £220

14" COLOUR MONITOR Philips high res RGB EGA, with stand & lead £75

COMPLETE SINGLE 3.5" 1MB DISC DRIVE, plugs into QL Trumpcard etc. DIP switchable for Spectrum, Amiga, BBC & PC. Boxed with instructions, dust cover, 13 amp plug and free disc £140

Single drive lead £8. Dual drive lead £10 £39

Dual drive consisting of two of above units £25

1 MB 3.5" DISK UNIT ONLY, Epson SMD-480L with front bezel - 1" high £75

EPSON PC KEYBOARDS 102 keys, complete with 5 pin DIN Connector £17

QL interface for PC keyboard

Case and lead for external mounting which enables both keyboards to be used and is easier to fit

QL Psion Software 2.35	pack £20	Quill, Abacus, Archive, Easel each	£10
QL Power Supply Unit	£12	Joysticks	£9
Centronics Interface	£24	Keyboard Membrane	£9.50
Complete User Guide	£8	QL ICs and Spares	ASK
Cartridges, Wallets of 4, new	£12	4 unused prog cartridges	£9

20 new cartridges in plastic storage box £55

SOFTWARE QL Decision Maker £18. Home Finance £18. QL Games £9. Q-Liberator Super Basic Compiler (disc) £60. Q-Liberator Budget Version for (MDV) £30. Q-Load Superbasic Quickloader with Q-ref Programming utility (Mdv) £15. File Transfer Programs, QL to other systems including PC, Text Tidy £15. Discover £20. Multi-Discover £30

BUSINSS SOFTWARE (Suitable for standard QLs) Small Traders Pack £24.95. Invoicer £19.95. General Ledger £19.95. Set of three £50. Mail Merger £14.95. Filer Pack £14.95. Also Stock Accounting £39.95. (For expanded QLs). Send SAE for software leaflets, or phone

All prices include VAT. Terms CWO, Access or Visa. Minimum order £10

Carriage £8.00 for printers, monitors & QL (overseas £20.00) other items £3.00 (overseas £6.00)

EEC LTD

18-21 MISBOURNE HOUSE, CHILTERN HILL, CHALFONT ST PETER, BUCKS. SL9 9UE

Tel: 0753 888866 Fax: 0753 887149

JOCHEN MERZ SOFTWARE

Im stillen Winkel 12 – 4100 Duisburg 11 – W-Germany Tel./Fax 0203/501274

News on the Emulator (9/3/91): Currently Drivers Level is C-23, Manual is Rev.4. Both Emulators (Extended 4 & MODE8) do not work on STE's (but you can get ST's, especially used ones, cheaper now!) Improvements on the Winchester and the Extended4 CON-Driver!

Special Offer!

For those, who would like to change to a QL-Emulator we offer complete Software & Hardware Package (worth £274.50) which allows full use of the Pointer Environment; **QL Emulator with EPROM Cartridge, QD III, QPTR and QSUP for ONLY £234** (Offer valid until 31 May 91)

QL-Emulator (Hardware, QJUMP's Drivers AtariDOS and more...) **£163**
EPROM Cartridge for ST (makes machine autoBOOT) **£29.50**
Floppy Adaptor to connect QL-Disk-drives to the ST **£8.90**
Other ATARI adaptors, serial & parallel cables, Harddisks etc, at low prices!

ABC-Keyboard Interface (for IBM PC/XT keyboards) **£41**
QIMI - Internal Mouse Interface with Real-Time-Clock **£39.90**
High Quality Mouse for QIMI or ATARI ST **£26**

QD – NOW VERSION III! Many additional features! Write for details **£36.50**
Upgrade from Version I - **£20** Upgrade from Version II - **£10**

QPTR - Re-released & Updated! Toolkit for Machine Code and SuperBASIC Pointer Environment Programmers. Revised manual and keys/macros updated. CONFIG is also explained **£29.50**
Update (new manual & disc) **£13.50**

QMENU Many QD-Users will know it: the Menu Extension. Now with more facilities, even real subdirectories are treated in a new file-select window. Programming instructions and examples for SuperBASIC and machine code. A scrap thing is also implemented now!. **£10.50**

DIAMONDS This is definitely a 'just one more go' game to keep you up at night. **£10.50**

Super Games Pack: Pengi, Arcanoid, Firebirds, Doppel Ion & Ion Gold. **£25**

EASYPTR Create your own Pointer Environment Menus and sprites and use them in your own SuperBASIC or machine-code programs. Many users waited for this package, as creating Menus is not very easy – until now. Put all the items you need on screen – that's it! Supports all the PE facilities, even split sub-windows and also uses the Menu Extension! Many examples. **£39.00**

QLQ £20 **Thing & EPROM Manager £18** **Firebirds £10.50**
Brain Smasher! £12.00 **QSUP £26** **Arcanoid II £10.50**
Ion Gold & Doppel Ion £10.50 **Patience £13.50**

Please add £2.10 for postage and package. All programs except Arcanoid, Firebirds & Ions need memory expansion. 3.5" discs add £1.50 for mdv's! All prices excl. V.A.T. E&OE

The Advanced Wordprocessor for the Sinclair QL

text87 plus4

text87 plus4 is our brand-new wordprocessor and desktop publisher for 1991. For Quill users we have a completely revamped "novice" user interface, on-line help system and automatic installation and setup program that make it much easier to use than Quill. Up to 15 (fifteen) times faster than Quill. Fully WYSIWYG (**text87** has long been capable of displaying and printing with dot-accurate justification, proportional spacing and different character sizes. It also does underlined, **bold**, superscript, etc., text in its spare-time!). Still with integrated spell-checker (now even further improved). For advanced users, we have a host of features unseen in the QL market (even in our products). If you are happy with Quill, get our 8 page free booklet to see what you are missing, else buy **text87**, you cannot go wrong.

text87 plus4: £60 ● fountext88 + founted89: £40
2488: £15 ● typeset90 :deskjet: £20 ● GQ5000: £40

Send for our latest free comprehensive booklet and for upgrade

Software available in English, French, German and Italian. Prices are inclusive of airmail. Payable by cheque, Postal Order or Eurocheque. Please specify language and disk system (all 31/2" and 51/4" formats can be supplied). text87 requires at least 256K memory expansion.

Software87, 33 Savernake Road, London NW3 2JU

NOW WITH DISKS

MICRODRIVE EXCHANGE

B = SuperBasic; A+O = assembler and object code; M+B = machine code and Basic loader; A+B+O = assembler and Basic loader and object code. S = supercharged; L = QLiberated; f1 = monitor mode; f2 = TV mode.

Established QL suppliers Sector Software are duplicating and distributing Microdrive Exchange programs, and supplying 3.5 inch disks. Please read the small print carefully, as different action is needed depending on whether you want mdv or disk copies.

I understand that Sector Software undertake only to supply these programs, and accept no liability for operation as defined by the authors. QL World cannot supply information about the programs other than that originally printed or supplied.

Any article reprints must be ordered and paid for separately at £2 each (£3 overseas) from *Sinclair QL World* at the Editorial address.

HOW TO ORDER

The Microdrive Exchange will copy the programs of your choice onto Sinclair microdrive cassette or 3.5 inch disk. Please note we can only supply ONE PROGRAM PER MDV OR DISK.

Orders for programs on DISK can only be supplied on the MDX's own disks, priced at £1, one disk per program ordered. Please do NOT send disks. Please state any specific density requirement for your set-up. Microcassettes cost £2.60 each.

Please send your orders to Sector Software, 39, Wray Crescent, Ulnes Walton, Leyland, Lancs. PR5 3NA. Tel. 0772 454328. Access/Visa accepted.

ORDER FORM

Value of programs ordered £.....

I require one microcassette/one disk for each program ordered (delete as applicable)

No. of 3.5in. disks required @ £1 each £.....

No. of mdvs required @ £2.60 each £.....

Post and packing £1.00

17½% VAT £.....

TOTAL £.....

PROGRAM IDENTITY NUMBERS:
/ / / / / / / / / / /

NAME .....

ADDRESS (BLOCK CAPITALS PLEASE) .....

.....

.....

.....Postcode.....

ACCESS/VISA NUMBER IF APPLICABLE:
☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Please copy on to mdv or disk the programs which I have indicated. I enclose a cheque/PO/Access or Visa number to the total of £..... payable to Sector Software.

THE PROGRAMS

1. LEAGUE SECRETARY by C.B. Storey (B) £3
You enter the match results and this program updates the league tables. Suitable for any sporting league organised on the lines of the Barclays Football League. Mdv only at present.

2. THE DOUBLE by P.G. Ives (Bf2) £4
A large football strategy game. You manage a team through four divisions, buying and selling, boosting morale through the league and F.A. Cup season.

3. SUPERBREAKOUT by R. Davison (M+B) £2
Fast m/c version of the classic bat, ball and wall game. Optional double bats and/or balls.

4. SPACE PODS by Simon Quinn (M+B) £3
Your lone ship must protect six energy pods against the aliens. Machine code. *QL World*, December 1987.

5. GRAPHIC WRITER by S.M. Walker (B) £2
A graphic design program which can save your pictures as SuperBasic commands for use in other programs. *QL World*, December 1987.

6. ZAPMAN by L. Miles (M+B) £3
Fast-action m/c version of the Pacman genre. Variable skill levels and maze formats.

7. SPACE INVADERS by Paul McKinnon (M) £3
Very fast, challenging version of the classic, with ugly aliens and protective shields.

8. SPELLED by Timo Salmi (T) £3
A complete spelling checker for Quill_list files, 7,500 words automatically expandable. Requires two cartridges and 512K expansion.

9. ADVENTURE PLAYTIME by A. Pemberton (B) MDV only £3
An extensive adventure where you must complete tasks for the inhabitants of a strange land. Coded messages and hints included.

10. YAHTZEE/GIRO by Jason Price/Henry Wrighton (B) £3
The popular dice game with instructions and graphics, for one or more players. *QL World* November 1987. Also space-disaster rescue game, in zero-gravity. *QL World* December 1989.

11. LOCK AND KEY by Henry Wrightson (B) £3
Unlock the secrets of eight screens of platforms, ladders, keys, poison weeds and mixed fruit — against the clock. *QL World* February, 1990.

12. RADAR by Nigel Ford (B) £3
You are control, monitoring the skies, checking aircraft, scrambling jets to intercept UFO's and shooting down enemy aircraft.

13. TAKTIX by Nigel Ford (B) £3
Six or more can play the computer in a fierce game of European conquest. Put aside at least an hour. *QL World* July, 1988.

14. BRIDGE by Peter Etheridge (B) £4
Excellent version, including accurate bidding, automatic or manual card play, replay hands, save and loads more.

15. CONQUEST by Andrew Pritchard (T) £4
"Superb graphics, with lots of original ideas. The best strategy game I've reviewed for *QL World.*"

16. MOLECULAR GRAPHICS by Mark Knight (M,B) £4
Molecular structures of any compound can be saved, reloaded, drawn and rotated on screen. "Excellent, one of the best educational programs on the QL." Disk or 2 cartridges and 512K needed.

17. SPEEDMIND by William Henderson (B) £3
A mastermind-style game played with coloured pages. You have 12 attempts at breaking the code against the clock. *QL World*, January 1988.

18. STELLARIS by David Carmona (Bf1) £4
Real-time space adventure against the computer, including economic simulations, lunar landing and superb graphics. *QL World*, June 1987.

19. BUSINESS GAME by David Smith (B) £4
A business simulator for any number of players, human or computer. The winner is the one who makes the most money! Networking advice from author. See *QL World*, April 1989.

QL Hardware Review

HP DeskJet Printer

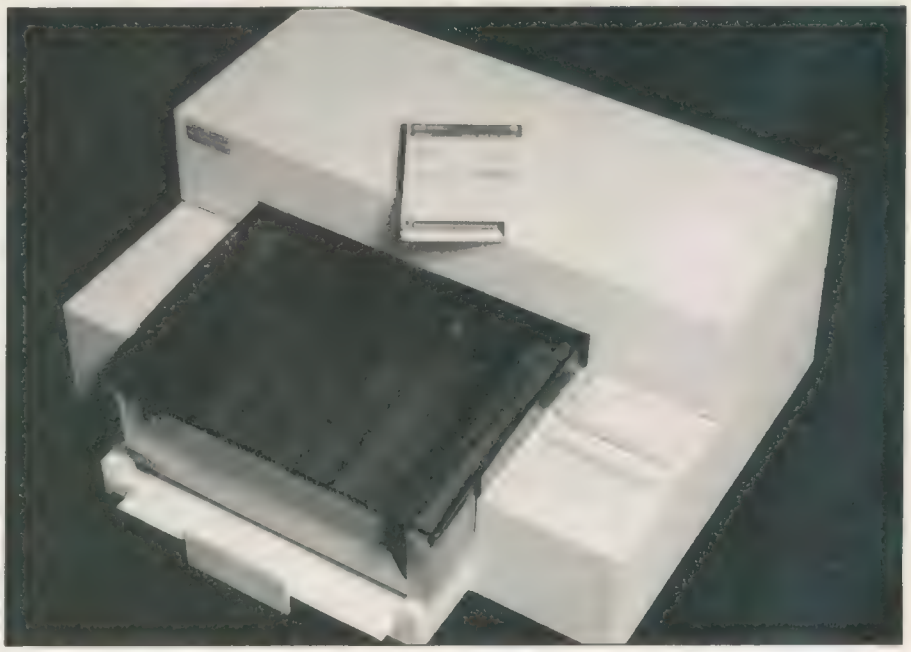
With all the interest in laser printers going around, Dr. Peter Cranfield offers his experience with an alternative.

What is grey and friendly and spits ink? If you can't guess then let me tell you: a DeskJet Printer from Hewlett Packard. The DeskJet printers represent, to my mind, one of the most useful types of printer available. They provide printed pages at a standard equal to that of a laser printer, yet cost less than some dot-matrix printers. For the past year I have been using DeskJet printers with my QL computers, and I do not know how I would manage without them.

The DeskJet printers are described by their manufacturers as *'Plain paper drop-on-demand thermal inkjet printers'*. They rely on the principle that when water-based ink in a tube is rapidly heated, a drop of ink is ejected from the orifice of the tube. If a sheet of paper is near the orifice, then the ink will land there and make a dot on the paper. Hewlett Packard have refined this process to provide ink cartridges with 50 small holes in a metal foil, spaced over one sixth of an inch - a density of 300 dots per inch. When this is scanned across a sheet of paper, dots of ink can be shot out on to the paper to build up images of letters and graphic symbols in strips of one sixth of an inch. The resulting image is of a resolution equal to a standard 300dpi laser printer, and may well be blacker and more even in appearance.

The DeskJet printer was first introduced at the start of 1988. Hewlett Packard intended this to be a printer that would provide laser printer quality at a very low price. The printer was designed to accept up to two font cartridges which could be slotted into the control panel of the printer, and thus extend the range of typefaces that could be used. Alternatively, memory cartridges could be slotted in, and so called 'soft' fonts could be downloaded from a floppy disc into the printer's new memory.

Within a few months the DeskJet was reduced in price and joined by a big brother, the DeskJet Plus printer. The DeskJet Plus had been given a different microprocessor chip for its brain, one which was able to address a much increased memory. This enabled the printer to handle a larger range of fonts, and also to print in 'landscape' mode for certain typefaces. Several new Font cartridges were introduced, and a further memory cartridge of doubled size produced. These two printers were on sale together for just over a year, until in August 1990, they were both superseded by the DeskJet 500 printer. The DeskJet 500 has all of the features of the DeskJet Plus together with further capabilities. It has extra fonts built in to its memory, can operate with an extended range of font cartridges, and is able to carry out 'kerning' on some of the proportionally spaced typefaces. Hewlett Packard reduced the price of the printer still further, and by 'shopping around', one can now purchase a DeskJet 500 for less than £400 + VAT.



The DeskJet 500 with font cartridge on the lid.

The printers take cutsheet paper only, of A4 size or similar, or envelopes through a manual envelope feed. They have a built in automatic cut sheet feeder, and the 'in' paper tray for this sits in the centre of the front of the printer. The printed sheets are delivered, again at the front, but in a separate 'out' tray, situated above the 'in' tray. There is a control panel on the top of the printer at the front on the right, and nearby are two covered slots to take the font cartridges.

When you unpack your new DeskJet printer, you remove from the box an instruction book (well, books really), an ink cartridge in a hermetically sealed container, a power supply, paper tray and cover, and the printer itself. The instruction book is quite well written. It has a small brother with 'READ THIS FIRST' on the front cover. I suggest you do this for it has the printer set-up instructions inside.

First steps include removing packaging and protective paper from the printer. The power supply module is then connected. This is a small box, about the size of a 100mm cube, containing transformer and rectifier, to deliver power to the printer at 20 volts from the mains supply. The lead from the power supply is connected to a socket under the base of the printer, hidden in a recess. This feature allows cables to be plugged in without them extending beyond the outline of the printer. As the printer can therefore be placed up against a wall, it may take up less desk space than

A font cartridge print foil face.

some smaller printers. Next to the power connector are two further sockets. One is a Centronics type parallel socket, the other is an RS232 serial type socket. Either can be used for connecting the printer to your QL, and as serial leads are cheaper, I use a serial lead, and connect to the ser 1 port on my QL.

When the leads are connected the printer can be turned back the right way up. The paper tray can is next to be fitted. The 'in' tray is already in place, but the 'out' tray must be clipped into its place, over the 'in' tray, and then the cover can be placed on top.

The next job is to fit the ink cartridge. This is in a hermetically sealed container to prevent the ink drying out. New cartridges are date stamped, and spare cartridges should not be kept in hot conditions. To fit the cartridge, the lid of the printer is opened, and the cartridge cradle can then be located on the right side behind the control panel. The ink cartridge has a tape stuck on it to protect the very delicate foil print head. Leading from the print head is a matrix of 64 electrical contacts, which have to make good electrical connection with small terminals in the cartridge cradle. The ink cartridge is grasped by the green coloured handle on the top, placed in the cradle, and pushed forward to "snap" into place. The lid of the printer is closed again, and all is ready to start printing.

Paper needs to be placed in the paper tray. Hewlett Packard recommend good quality photo-copier paper as being suitable for good results, but high quality bond or wove paper may give even better quality. The surface of the paper is important, and its ability to absorb the ink well enough to allow rapid drying yet not to allow smudging is crucial. As the instruction book says, trial of paper before bulk purchase is essential. I have had good results with photo copier paper from 'Neat Ideas' at £1.79 per ream, and excellent quality from Wiggins Teape's Conqueror paper at about £12.00 per ream. Paper is placed into the 'in' tray, face down and with the upper edge of the paper into the printer. When the first sheet is drawn by the printer from the pile of paper, it is taken round by a large roller, upwards and onto the printing platen near the print head. The face of the paper is now uppermost, and the upper edge of the sheet is heading out of the printer towards the out tray. When the paper has been printed, the printer holds onto the sheet of paper for a second or so, and then two arms at the side of the 'out' tray are raised, and the sheet drops onto the tray, or on to the previously printed sheet. This slight delay is to prevent smudging of the ink which takes a few seconds to dry.

The printer can now be turned on. Perhaps it would be sensible to carry out a self test before any important printing is done. On the control panel are four large buttons, and four small buttons. The large buttons are 'Form Feed', 'Font', 'Mode' and 'On Line'. The row of small buttons consist of two for paper movement, one for priming the ink cartridge, and a reset button.

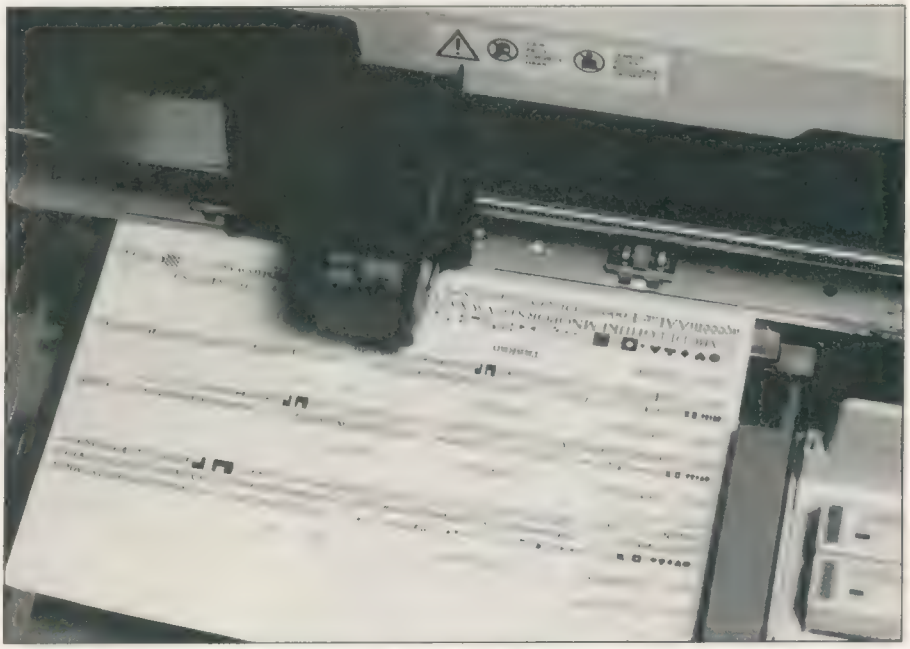
To initiate the self test sequence, the 'Font' button is pressed down, and the printer is turned on by the on/off switch situated on the front lower corner. The 'Font' button is held down for a couple more seconds and then released. The printer will go into its reset routine, whereby the printer will make sure that any paper in the printer rollers is expelled, and the printer head will traverse the platen to establish its positioning. The printer will pause a second, and then the 'Busy' lamp will light, and the self test will begin.

However, instead of the whining buzz of a dot-matrix printer, or the rat-a-tat-tat of the daisy wheel printer, there is just a gentle sound, a little like wet chamois leather upon glass. There is not even the hum of a cooling fan that is heard near laser printers.

Assuming no extra font cartridges have been installed, the printer will print out samples of each of the typefaces built into its memory. It will print out Courier in 10 cpi, 16.7 cpi and 20 cpi. Next it will print Courier Italic in 10 cpi before going on to CG Times, and Letter Gothic. It then prints out on a second sheet of paper some bold print, underlined print, double underlined print and draft quality print. On a third sheet, it prints out Courier in three sizes in landscape format.

So far so good. Now it is your chance to print from your QL, to produce the report or letter that has taken so long to type. This is where it may become difficult. The DeskJet printers all speak a computer language called Hewlett Packard PCL printer language. Most dot matrix printers and most software packages for the QL communicate in a language of Epson printer control codes. The two languages are not the same. When the wrong language is used, all that you will get is an inky mess at the top of one sheet of paper, and despair. How do you get round this problem? There are two ways: firstly, you can buy an 'Epson FX-80 Printer Emulation Cartridge' for your printer or, secondly, you can make sure that all of your software is able to communicate in the HP PCL language.

If you purchase the Epson Emulation Cartridge, it is slotted into one of the font cartridge slots near the control panel on the printer. This must be done with the printer turned off. When the printer is



The DeskJet 5000 in action, producing a sample font sheet.

turned on again, a self test will reveal a different result. The DeskJet printer will now speak the Epson language, and will now happily print out all the normal Epson type faces, and will respond to all of the normal Epson FX codes. Documents from Quill, screen dumps and graphics will be printed out as though the printer were a dot matrix printer but of a very superior quality.

However, although this is a very useful method of using your DeskJet printer, it will not allow you to access all of the other typefaces hidden inside the printer. So, for many applications, altering your software to suit the printer may be your method of choice. Most QL users will, of course, use the Quill word processor. Use of the *install_bas* programme will enable you to set up a *printer_dat* file correctly for the DeskJet printer. The DeskJet owner's manual has a section at the back with a summary of all of the printer commands, written not only in normal characters but also in Ascii form and Hex. From this you can enter into the installation program the codes for superscript, subscript, bold etc. etc. A choice can be made as to which typeface is to be used, and the correct code must be written into the preamble section of the *printer dat*. The choice of typefaces standard in the printer includes, Courier in several pitches (5, 10, 16.67 and 20) Courier Italic (5, 10, and 20 pitch), Letter Gothic (12 and 24 pitch) and Letter Gothic Italic (12 and 24 pitch). All of these are available in two heights, 1/6th inch and 1/12 inch, bold or normal. Depending upon your use of Quill the choice of typeface will up to you. In theory, it is also possible to use Quill with the other fonts, such as CG Times, Times Roman and Helvetica etc. However, great difficulty will be experienced with this as Quill can not cope with such proportionally spaced typefaces. To achieve acceptable results with these typefaces you must look elsewhere.

For the past three years, I have been using the really excellent *text87* wordprocessor program. You can purchase from Software87 a ready produced printer driver for the DeskJet500 which will enable you to produce printing of the highest quality. The DeskJet500 printer driver will give you access to all of the typefaces currently available on the DeskJet500. For those people not familiar with *text87* perhaps a few words are necessary here about the program. *Text87* is a very fast and very interesting word processor. It has the ability to be extremely flexible in its handling of different typefaces, character spacings, line feed settings, line widths etc. I started using *text87* with a daisy wheel printer, having found Quill unable to handle proportionally spaced typefaces routinely. A lot of my documents are professional letters, reports, pamphlets and leaflets, and presentation is very important to me. *Text87* allows me to produce work in proportional spaced style, with one, two, three or four columns per page.

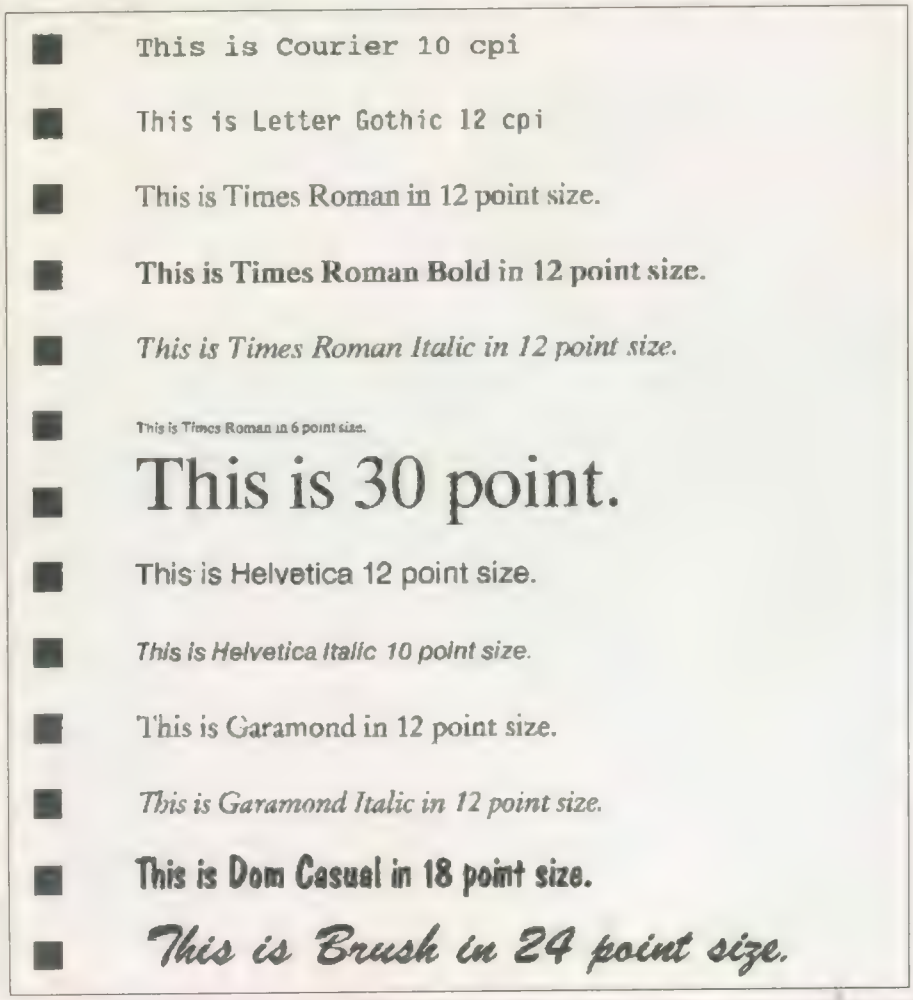
From the DeskJet printer with the *text87* printer driver becomes work that looks like professional printing. Several newsletters have gone straight from my DeskJet to the print shop for offset litho printing. When *text87* is loaded into the QL, there is no need for setting up all the printer codes and other details; you just set the parameters for your document and away you go. Line spacing can be set in steps of 1/300th inch, and line lengths set to the nearest mm. The DeskJet500 driver is set up to allow all of the built-in typefaces to be accessed immediately. This means that without the purchase of any font cartridges, you can print out letters in typewriter style, or, using the CG Times typeface, you can produce work in 12 point and 6 point Roman characters, just like the printers use.

The point size refers to the height of the character. 72 points represent one inch. Thus a 12 point character set is sized 1/6th inch from the top of the capital letters to the botttom of the descenders or the lower case letters.)

Alternatively, if you wish, you can go ahead and purchase font cartridges to extend your range of typefaces. I find that the Times Roman Collection Cartridge and the corresponding Times Roman Headlines cartridge make a very useful pair for general work. These contain a range of fonts from 6pt to 30pt. Not all of the point sizes have bold and italic character sets included in the cartridge, but this does not often matter, the selection provided is usually sufficient. The Times Roman typeface is different from the CG Times typeface built into the printer, but the difference is probably only apparent to most viewers when the two typefaces are compared together. The Helvetica cartridges also form a useful pair, but perhaps are not quite so versatile for ordinary use. The cartridges provided new for the DeskJet500 printer include the Garamond typeface, the Dom Casual typeface and the Brush Script typeface. The Garamond is a very fine looking serifed typeface. It is more subtle than the Times Roman, and is suited more to use in books and important presentation work. The Dom Casual and the Brush are much more lighthearted in character, and must be used with care, as too much of either of these would spoil a document.

If you wish to produce documents of the highest quality, comparable to those produced on the the most advanced wordprocessors then I cannot do other than recommend text87 with the DeskJet500.

However, perhaps your needs for a printer are not those of a wordprocessing workhorse. Here too the DeskJet may fit your requirements. I use one of my DeskJet printers in my Dental Surgery, printing out all of the patient details on the myriad of different forms so kindly provided for us by the National Health Service. All of my patient database is run on a QL, and



whenever a patient comes for treatment, a form has to be completed. The trusty DeskJet printer sits quite happily at the reception desk, quietly and uncomplainingly printing out forms without a hiccup. In this instance, the software for the surgery has been written *(by myself, but that is another article that has yet to be written)* making use of the HP PCL language. For over a year this system has been in use, and not once has the printer given any trouble. Its ability to pick up preprinted forms and print the data accurately in the required spaces is unquestioned. In fact, the Government's Form Printers are more inaccurate in their production of the forms than the printer is in its positioning of its output. Some of our forms are read at their destination at the Dental Practice Board by an Optical Character Recognition machine. The OCR machines are programmed to read handwritten letters, and for some reason, known only to those civil servants who designed the forms, the character spacing required is 66/300 of an inch. This can be coped with by the DeskJet printer through careful use of the PCL language. The quietness of the printer is a boon in the environment of the reception area, and nobody has complained about it being a nuisance or tiring. Even our notepaper is printed by the DeskJet, thus saving us money on the printing of stationery.

Here we get to the nitty gritty. If this printer is so wonderful, why are other printers still being made? Well, there are some disadvantages. The first one must be the ink. Ink cartridges cost a fair amount of money, and the ink smudges if it is wetted by water. *(The author is perfectly correct. A small drop of tea proves the point.)* The print quality is, however, beautiful.

However, let us look at these points in turn. Firstly the cost of running the printer depends upon your usage. If you stick to normal Courier typeface, Hewlett Packard estimate that you will obtain about 500,000 characters from an ink cartridge, which is equivalent to about 800 pages of A4 paper. At a cost of £14.60 + VAT this represents about 2p per page. If you use draft printing mode though, then your ink use will be halved. Conversely, use of more elaborate typefaces will increase your ink use. However, there are some suppliers selling the cartridges at lower prices, and there is also avallable, from EQ Consultants, in Scotland, a non Hewlett Packard kit for refilling the ink cartridges. I have used the refilling kit, and it is certainly as good as the kit manufacturers claim. For a cost of about £60.00 you receive a box containing a drill, to open a hole in the cartridge, some special bungs to seal the cartridge after refilling, and a bottle of ink sufficient for about eleven refills. The ink in the refill kit is a little blacker than the standard ink, but is very slightly slower in drying. However, it works very well indeed.

The smudging of the ink is more of a problem of perception than one of fact. If you spill water on the printed areas, the ink will run. If care is taken, it is not a difficult problem to prevent. Hewlett Packard have just introduced a new formulation for their own ink which does not run as much as the original ink. I can confirm that this is a great improvement. However, to put the problem in perspective, a lot of writing inks used in fountain pens are similarly water labile, and nobody worries overmuch about this. If a document is to be placed in an environment where it may become splashed, then spray the document with an art fixative spray. It's as simple as that. Alternatively, a good photocopy can be made.

What other problems are there? Well, you cannot print in 'landscape' format unless you stick to Letter Gothic and Courier. This has not proved a big problem for me, but it could be a problem for some people. The only way round this is to purchase a laser printer which, with its much greater memory capacity, is able to achieve landscape format printing of proportionally spaced typefaces. However, how much extra will this cost you? Quite a lot, you will find.

Paper size

The next problem is paper size. Although you can feed single sheets through the envelope feed, you may have difficulty with sheets that are much smaller than A4 size, as they are hard to keep straight. However, even this can be overcome by starting with A4 and cutting to size after printing. Incidentally, it is possible to feed light card into the printer, if it is done one sheet at a time. This can be very useful in certain circumstances.

If you are not the sort of person who likes to know how things work then I suggest you skip this bit. If I have not yet convinced you that this is the printer for you, then this will not help. The DeskJet printers have evolved over their short lifetime, and fonts produced for the 500 printer cannot be used with earlier printers. Let us look at some of the design features of the printers. The characters printed by the printer are stored as a bit-map in the printer's permanent memory, in the permanent memory of plug-in font cartridges, or on a floppy disk, as 'soft' fonts, and are transferred to the volatile memory of plug in memory cartridges. The bit-map is similar to the method by which the QL stores its fonts of characters, but as the resolution is 300 dots or pixels per inch, each character uses quite a lot of memory.

From the bit-map of a particular letter, the DeskJet works out which ink jets must fire at each point of the ink cartridge's traverse across the page. The printer has routines built into its programming that enable it to print letters half the size of a bit-map letter. Hence a 12pt letter can be printed as a 6pt letter by the process of omitting alternate dots in height and width. This is a slight oversimplification of the process that is followed by the printer, but 'algorithmic' half height printing is carried out on most fonts. Similarly, bolding of letters can be carried out by the printer by adding an extra row, or two, of dots on the bit-map image of a letter. However, this is not always an acceptable way of producing bold type, especially with the proportional typefaces, and some typefaces will have separate bit-maps for bold characters and for italics. Draft quality printing is achieved by printing a blank instead of a dot in alternate dot positions.

Each character fits within a grid pattern or cell. The size of the cell determines whether the ink cartridge has to make one, two, three, or four passes to build up the complete character. The width of the character is defined by the cell, and will have a central character area, a leading space area, and a trailing space area. These space areas allow for the space between the letters, but may be occupied by parts of the letters, ie. the leading space will contain the descender of sloped italic characters. With the advent of the DeskJet500 printer, the ability to allow overlap of the character cells has been introduced. This feature has been called 'kerning' by Hewlett Packard, and indeed it acts in a similar fashion to true kerning, but it is not variable and is really just the ability of some characters to overlap each other's cell spaces on the page. However the effect in the print is remarkable. The Brush Script typeface has letters that join up beautifully, and the descenders of the Italic Garamond characters flow under the edges of previous letters. If you examine the Times Roman italic fonts, produced for the DeskJet Plus printer, the letters with descenders are slightly less sloping, just to prevent this overlap.

Here then is the printer of the nineties. If you require a robust printer at moderate cost, that will provide you with results which will make you proud to have produced them, then take a look at the DeskJet printer. It is small enough to fit in your home or office, is quiet and convenient. No wonder Hewlett Packard are proud of it.

SUPPLIERS

Hewlett Packard Ltd.,
Eskdale Road, Winersh,
Wockinham,
Berkshire RG11 5PR.
Tel: 0344 369369

Software 87,
33, Savernake Road,
London NW3 2JU

E.Q.Consultants,
New Gilston,
Fife KY85TF
Tel: 0334 84248

DIY TOOLKIT

Simon N Goodwin extends his SET routines to allow Resident Variables that are shared by SuperBasic tasks, and impervious to CLEAR and NEW commands.

The *DIY Toolkit* command SET creates resident entries in the SuperBasic Name Table, so that stored values of any type can be accessed by all subsequent Basic tasks. I have now developed the SET routine, introduced in April, so that tasks can ALTER shared values as well as read them.

This month's listings extend the idea of Resident Constants to encompass Resident Variables, building on the code and concepts introduced last month. If stuck you can get the back issue from the publisher, or text and programs together on disk.

Once a SuperBasic program has SET the values of Resident Variables they remain available to all Basic tasks until you re-set the machine. Later any SuperBasic program can read the value just like any QL variable or function, or ALTER the value accessible to other tasks.

Thus concurrent or sequential *Turbo, Supercharged* and *QLiberated* tasks can communicate rapidly with SuperBasic(s), and one another, using resident constants and variables just like 'toolkit' functions.

Chaining

In byegone times QL users dreamt up devious ways of 'chaining' programs and passing data between tasks. Some poked 'unused' memory, leading to compatibility problems – others used slow temporary files, or pipes. SET and ALTER are superior to those methods; they are more compatible, faster and much easier to program. I wish I had written them years ago.

ALTER extends the code of SET. The new version dynamically allocates memory for strings in a 'pool' allocated on the Qdos Common Heap. The code works fine even if the pool is split into several sections; it has been designed to make it easy to avoid problems of memory fragmentation.

Like SET, ALTER expects two parameters: a value, and a corresponding name that will be used to identify the value in future. The type of the name is determined by the last character, as usual. Integer values -32768 to 32767 end with a per cent sign, while a final dollar sign denotes a string of text up to 32K long. Other values are held in 44 bit Qdos floating point form.

Thus Northern readers might SET NOWT to 0, SET NOWT TO "" and SET NOWT% to NOWT. I gave many more general examples last month. Values are coerced to match the name; it is worth using integer values when appropriate, so that the computer does not have to convert them whenever they are fetched.

There is an important difference between the syntax of SET and ALTER. The first parameter of SET should by an un-

```
* QL WORLD DIY TOOLKIT - SET, SET% & ALTER extensions - RESIDENT VARIABLES
* Version 1.66, Copyright 1991 Simon N Goodwin, suggested by Luca Pivato.
*
lump_size   equ     1008            RAM lump size taken from Common Heap
call_code   equ     20153           68000 OPCODE for JSR .L
string      equ     1               SuperBASIC type code of a string
float       equ     2               Type code for floating-point values
integer     equ     3               16 bit signed integer type code
*
start       lea.l   define,a1       Point to the table of details
            move.w  $110\w,a2       Find BP.INIT (a word vector)
            jmp     (a2)            Add SET to SuperBASIC
*
* Internal variables, not for ROM; could be made a QPAC or Argos THING
*
heap_lump   dc.w    lump_size       SET memory allocation size, 16-32760
sentinel    dc.l    0               Heap pointer   (NOT suited to ROM!)
*
read_int    moveq   #2,d1           Extra space needed
            bsr.s   checker         Allocate room on the stack
            move.l  (a7)+,a0        A0 -> Result
            move.w  (a0),0(a1,a6.l) Fetch and stack the result
            moveq   #integer,d4     Indicate INT result
            rts                     Return D0 set by CHECKER
*
read_ptr    moveq   #6,d1           Extra space needed
            bsr.s   checker
            move.l  (a7)+,a0        A0 -> Result
            move.w  (a0),d3         Checked for even-ness earlier
            moveq   #0,d0           MT.INF trap key (be sure)
            trap    #1              Find the system variables
            move.l  0(a0,d3.w),d2   Read the system vector
            move.l  d2,d1           D1 will be the exponent
            beq.s   normalised      Job done, if D2 & D1=0; result 0
slow_loop   move.w  #2080,d1        Guess at the exponent + 1
normaloop   subq.w  #1,d1           Halve the weight of the guess
            add.l   d2,d2           Double the mantissa
            bpl.s   normaloop       Does it still fit?
            lsr.l   #1,d2           Whoops, ensure sign=0 (+ve)
```

quoted name, with no previous value, whereas ALTER expects the name of a previously SET value, in quotes or inverted commas.

Presume we have SET PRINTER TO 'SER', and want to re-direct programs to use a remote printer on another network station, by changing the value of PRINTER to 'N1_PARC'. We cannot simply type ALTER PRINTER to 'N1_ PARC', because SuperBasic will pass the value of PRINTER$ rather than its name to the routine that performs ALTER. The result is an 'in use' error if the name "SER" exists but has not been SET, and 'not found' if the name is not in the SuperBasic Name Table.

'Bad parameter' has its usual meanings, while 'error in expression' signals that the type of a name does not match the type of the second parameter, as in SET NOWT% TO " ". The separator is not checked, so you can use a comma instead of TO, as with other QL commands like COPY and CONNECT.

If SuperBasic finds a function name as a parameter, it calls the function and passes on the result, rather than the name of the function. If you enter SET P1 TO 3 the code for SET is passed two floating point values – 3.141593 and 3.0 – with no way of knowing the name from which the first value came. It reports 'not found', as 3.141593 is not a valid SuperBasic Name.

Familiar

You may already be familiar with this behaviour. Names that have no value can be used without quotes to identify files and devices, but you must put the name in quotes or inverted commas if you want it taken literally. LOAD PI is no good unless you're looking for a file called '3.141593'.

LOAD "lt" or LOAD 'iT' will load the file called IT, even if your program includes a variable or function called IT, or you have previously SET IT. Hopefully you will choose a name that is a better reminder of its meaning; you are allowed up to 255 underscores or alphanumeric characters in any SuperBasic name. The text is only stored once, so long names do not slow down programs.

SET needs a name parameter but ALTER expects a string expression. ALTER "PRINTER$" to 'N1_PARC' works as expected, changing the value of the resident variable PRINTER$. The case of letters is not significant, so ALTER 'Printer$' to "N1 PARC" is just as good.

The use of quoted names means that ALTER works as well from compiled tasks as it does from Basic. ALTER suspends multi-tasking momentarily while values are changed, so that tasks accessing the resident value do not end up with a mixture of the old and new values!

ALTER is not as fast as SET, because it needs to look through the SuperBasic

```
normalised move.w   d1,0(a1,a6.l)     Exponent
           move.l   d2,2(a1,a6.l)     Mantissa
           moveq    #float,d4         Indicate FLOAT result
           rts
*
read_float moveq    #6,d1             Extra space needed
           bsr.s    checker
           move.l   (a7)+,a0          A0 -> Result
           move.w   (a0)+,0(a1,a6.l)
           move.l   (a0),2(a1,a6.l)   Transfer mantissa
           moveq    #float,d4         Floating-point result
           rts
*
read_str   move.l   (a7)+,a0          A0 -> Address of Result (length.W)
           move.l   (a0),a0           Pick up string value address
           moveq    #3,d1             Room for length & odd byte
           add.w    (a0),d1           Add room needed for text
           bclr     #0,d1             Count in whole words
           bsr.s    checker           Check there's room
           lsr.w    #1,d4             D4 := D4 DIV 2, # text words
           subq.w   #1,d4             Adjust word count for DBRA
           move.l   a1,a2             A2 is the offset of stacked words
copy_text  move.w   (a0)+,0(a2,a6.l)  Stack one word from the heap
           addq.l   #2,a2             Advance up the maths stack
           dbra     d4,copy_text      Copy words till all are done
got_string moveq    #string,d4        Result datatype is STRING
           rts
* Check for D1.L RI Stack bytes; alters D1-3, D4=old D1, A1=RI.SP
*
checker    move.l   d1,d4             Save size for use later
           tst.b    $54(a6)           Turbo/Supercharged code?
           bmi.s    found_room        Always 120+ bytes free
           move.w   $11A\w,a1         BV.CHRIX checks space
           jsr      (a1)              D1 bytes are needed
found_room move.l   $58(a6),a1        A1 := (new?) BV.RIP
           sub.l    d4,a1             Grab the bytes
           move.l   a1,$58(a6)        Update BV.RIP to suit
           moveq    #0,d0
           rts
*
* (SET [#] unset_name / ALTER "name_text") TO value - parse parameters
*
alter      moveq    #-1,d5            If D5.L is -ve, it's ALTER
           bra.s    parameters
set        moveq    #1,d5             Distinguishing mark
parameters lea.l    16(a3),a4         Check for 2 parameters
           cmp.l    a4,a5
           bne.s    bad_parm2
*
* Make A4 -> SuperBASIC (task 0,0) for Master Name Table access, etc.
*
           moveq    #0,d2             Search entire task tree
           moveq    #0,d1             Look for SuperBASIC
           moveq    #2,d0             MT.JINF Trap key
           trap     #1                A0 := base of task 0,0
           move.l   a0,a4
           tst.l    d5                Is this ALTER?
           bmi.s    lookup
```

Name List to find each name. This slows down changes to resident variables, but the values are accessed as fast as ever once they have been assigned. The same fast routines are used, whether the value was SET or ALTERed.

The parameters of ALTER may be expressions, and may include calls to other resident functions. You could use SET SCORE to 0 and follow it with ALTER "SCORE" to SCORE+1, or ALTER "ME$" TO ME$ & "Dip. Phil". You could SET THIS$ to "THAT$", SET "THAT$" TO THIS$, and later ALTER THIS$ TO "", changing the value of THAT$, rather than THIS$.

Resident variables and constants are powerful extensions to QL and Thor systems, but this Toolkit volume has an extra purpose. It illustrates the memory-management facilities built into Qdos. These are simple and easily overlooked, but they embody fundamental algorithms that are both interesting and useful.

Dynamic

'Heaps' form the basic data-structures of Qdos, Argos and SuperBasic. SET and ALTER use them to build a new dynamic and persistent environment outside SuperBasic. The User Heap makes these extensions much superior to the 'environment variables' of PCDos or 'core common' in old minicomputer systems.

All Resident values are held in the User Heap. Integer and Float entries use a 16 byte heap entry. Resident strings use between 24 and 32,792 bytes, depending on the text length. Heap allocation sizes are rounded up in steps of eight bytes.

A SET integer uses 12 out of the 16 bytes allocated to it it the heap. The first long word is the length, invariably 16. The SuperBasic Name Table vector for the name points to the code in the next six bytes – a JSR to the READ_INT routine, which picks up the integer data value in the two bytes immediately after the long jump destination address. The last four bytes are un-used.

Floating-point values are held in much the same way, but the word is the exponent of the value and the spare bytes hold the long word mantissa. SET# stores an integer and uses it as an offset to extract a long word from the System Variables.

Resident strings are held in two sections, rather like arrays and their descriptors inside SuperBasic. The first ten bytes hold the length and the code, followed by a long word address, which points to the string value.

When a Resident string is SET the value gets put into the heap space straight after the code, but if you ALTER the string value so it won't fit, my code jettisons the old value space and allocates a new space elsewhere in the User Heap.

If you extend a string value and overflow the space reserved, ALTER splits the

```
*
            move.b   1(a3,a6.l),d5     Get first NT entry type
            beq.s    bad_param2        Strange, and best avoided
            btst     #7,d5             Is there a # at the start?
            beq.s    normal_set
            moveq    #0,d5             Flag a special SET data type
normal_set  move.b   0(a3,a6.l),d1     Get the name type too
            beq      notyetset         Handle an unset name
*
bad_param2  moveq    #-15,d0
bad_exit2   rts
*
lookup      lea.l    8(a3),a5          Isolate the first parameter
            move.l   a5,d7             Remember what we forget for now
            move.w   $116\w,a0         Fetch CA.GTSTR vector
            jsr      (a0)              Try to fetch a string parameter
            bne.s    bad_exit2         Exit unless it worked
            move.w   0(a1,a6.l),d0
            beq.s    bad_param2        Reject a null string
            move.w   d0,d1             Save length for later
            lea.l    2(a1),a5          Save offset of text
*
* Convert lower to UPPER case; reset bit 5 of parameter bytes
*
            moveq    #-33,d2           Conversion mask = NOT $20
lock_case   and.b    d2,2(a1,a6.l)
            addq.l   #1,a1             Advance through text
            subq.w   #1,d0             Count down length
            bne.s    lock_case         Convert all characters
*
* Work out the datatype to be SET from the name text, if need be
*
            tst.b    d5                Do we need the type of parameter 1?
            beq.s    type_cast         No, it's a float-type SET # command
            move.b   1(a1,a6.l),d3     Get the last character of the name
            moveq    #string,d5        Assume a string, to begin with
            cmp.b    #'$'-32,d3        Did the name end with a dollar?
            beq.s    type_cast         Yes, it's a string
            moveq    #integer,d5       Maybe an integer, then?
            cmp.b    #'%'-32,d3        Did it end with a per cent sign?
            beq.s    type_cast         It's an integer
            moveq    #float,d5         Other last characters denote floats
*
* Now try to find the name text in the SuperBASIC Name List
*
type_cast   trap     #0                Pre-empt disturbances
            move.l   24(a4),a0         A0 -> Name Table Start
            move.l   28(a4),d0         D0 -> Name Table End
            move.l   32(a4),d3         D3 -> Name List Start
*
next_name   move.w   2(a0,a4.l),a3     A3.L is offset in NL
            adda.l   d3,a3             (A3,A4.L) -> Name
            cmp.b    0(a3,a4.l),d1     Compare length
            beq.s    got_length        Length matches!
advance_nl  addq.l   #8,a0             Advance through NL
            cmp.l    a0,d0             Stop at the end
            bhi.s    next_name
            moveq    #-7,d0            Not found (yet)
            bra      super_stop
*
```

```
*
* Check the name to see if it matches the parameter
*
got_length move.b   1(a3,a4.l),d4
           and.b    d2,d4              Ensure consistent case
           cmp.b    0(a5,a6.l),d4
           bne.s    advance_nl         Mismatch, try another
           move.w   d1,d6              Save residual length
           subq.w   #2,d6              DBRA count the rest
           bsi.s    found_it           Found name, length 1
           move.l   a5,a1              D4 & A1 are temporaries
check_name move.b   2(a3,a4.l),d4
           and.b    d2,d4              Convert case of name
           addq.l   #1,a3              Step through Name List
           addq.l   #1,a1              Step through parameter
           cmp.b    0(a1,a6.l),d4
           dbne     d6,check_name
           bne.s    advance_nl         Name mismatch, go on
found_it   cmp.b    #9,0(a0,a4.l)
           beq.s    lookup_ok          It's already a resident FN, hurrah
in_use     moveq    #-9,d0             Report that the name is 'in use'
           bra      super_stop
*
lookup_ok  andi     #$D8FF,sr          User mode re-starts the scheduler
           move.l   d7,a3              D7 points past parameter 1
           lea.l    8(a3),a5           Now A3 & A5 bracket parameter 2
           move.l   a0,d7              D7 is the offset of the NT entry
           bra.s    got_name
*
bad_param  moveq    #-15,d0            ERR.BP report code
bad_exit   rts                         Return error code in D0
*
notyetset  move.w   2(a3,a6.l),d7      Get parameter name NT index
           ble.s    bad_param
           ext.l    d7
           lsl.l    #3,d7              Scale for 8 byte NT entries
           add.l    24(a6),d7          Add offset from Basic base to NT
next_para  addq.l   #8,a3              Advance to the next parameter
*
* A4 -> SuperBasic, A3 & A5 -> Parameter #2, D7 is Basic NT entry offset
* Evaluate parameter 2; D5.B is the data-type, 1-3, or 0 for a 'vector'
*
got_name   and.b    #15,d5             Isolate documented data-type bits
           move.b   d5,d4              Make a temporary copy of the type
           bne.s    not_vector         Type 0 in D4/5 means it's a vector
           moveq    #3,d4              Integer parameters suit SET #
not_vector ext.w    d4                 Type Word := 1 , 2 , 3
           add.w    d4,d4              Now type code is 2, 4 or 6.W
           suba.l   a0,a0              Clear A0 the quick way
           suba.w   d4,a0              Remember the implicit EXT.L
           movea.w  $118(a0),a0        Pick up a vector: $116\114\112?
           jsr      (a0)               Put parameter value on stack
           bne.s    bad_exit
*
* Is it a pre-existing function?
*
           tst.b    0(a4,d7.l)         Has the name got a value yet?
           beq.s    neophyte           Name types 0 & 9 are possible
           move.l   4(a4,d7.l),a0      A0 is the code vector
```

string into two heap entries: the code remains un-moved, in the first 16 bytes of the SET allocation, along with the value pointer, so there's no need to update the Name Table.

The place where the old value used to be stored is released and may be used to record later SET data or ALTERed text. A new User Heap entry holds the replacement value, and the remains of the first entry are updated to point at the new value.

Free space

If the code runs out of free space it allocates more and links it into the User Heap. You can set the default size of 'lumps' taken from the Common Heap. If the default lump-size is too small, SET and ALTER add it on to the string length to find a space that will definitely be big enough, with the usual room for expansion.

In April I explained the merit of putting the little bits in a User Heap, rather than as individual Common Heap entries like ALTKEYs. The extra code is well worthwhile. It keeps overall system performance up, even if you have hundreds of resident variables or constants.

Memory can become scarce if you intend to SET long strings; you may need to configure your files or design your BOOT program to avoid loss of memory due to 'fragmentation'. Particular care has been taken to control such problems.

Common heap

SET draws its space from the Common Heap, used for channels, buffers, and all kinds of temporary and permanent storage. It you get part-way through a session, with ram disks formatted and other stuff in use on the heap, you probably don't want your memory divided up when a long string is SET or ALTERed. SET and ALTER can use memory anywhere in the QL map, but ill-timed allocations may split the large contiguous area that Qdos needs for tasks and Basic.

One option is to increase the lump-size, so that you lose all that you will need at the beginning; note that this utility does not allocate a lump from the Common Heap until the first name is SET. This option is best if you know the maximum total amount of data you will need to handle. The lump-size, 16 to 32760 bytes, is a word value stored in the 15th and 16th bytes of the CODE file. Remember to allow space for code as well as data.

Alternatively you can pre-extend strings, using SET TO FILL$ to allocates the maximum space you might need later. This works like DIM in Basic; it records the maximum space, and pre-allocates it. SET BUFFER$ TO FILL (" ", 512) ensures from the start that there is always room for 512 bytes in BUFFER$. You can ALTER it to

any smaller value, and the extra will be held in reserve in case the length goes up again.

If you leave SET and ALTER to their own devices they use true dynamic allocation, just like the interpreter. The snag of this is that you may end up using substantially more space than with either of the apparently more 'wasteful' options. There is a tendency for useless lumps of empty space to become scattered through the memory as arbitrary areas are used and discarded.

Allocation

In practice dynamic allocation suits ALTER quite well, thanks to the memory reuse scheme, which minimises moves, and the packing of data inside the User Heap. Sizes are rounded up onto eight byte boundaries so small changes in size usually fit the space allocated, rather than result in the allocation or release of tiny spaces which will be fiddly to keep track of and unlikely to be useful later.

The program is listed in two forms. **Listing one** is the assembly code, tested using HiSoft's *DevPac*. You may edit and reassemble this with your own assembler..

Listing two is the usual hex-loader, with 760 bytes of DATa from line 590 onwards. Enter and RUN this program to create a file containing the ALTER code, then load it into ram like this:

```
X=RESPR (760)
LBYTES FLP1_ALTER_CODE, X
CALL X: NEW
```

The NEW is not necessary on JS and MG Roms. Once the code is loaded you can SET and ALTER your own Resident Constants and Variables, which will persist until you reset the computer, or discard them with a utility like FORGET from DIY Toolkit's Volume B.

Explorer

Listing three is the User Heap explorer, tested with JS or MG roms. It lists all the addresses and sizes of free and used spaces in the User Heap, but assumes that there's only one lump – otherwise it goes on listing the rest of the Common Heap when it fails to find the end of the User One.

The DIY disk version includes a variant of Phil Spink's Common Heap lister which uses SET# vectors to explore the Common Heap. This explicitly identifies the SET heap by size, purpose and owner, showing its position amongst other lumps of space allocated by tasks and devices.

If you have AH or JM roms you must type in the commands to load SET_CORE (line 170) *before* loading the rest of Listing three. The DIY disk version uses QUEUE%

```
            cmp.w   #call_code,(a0)+  Is it one of mine (probably!)
            bne.s   bad_param         Only change FNs that start right
            cmp.b   #1,d5             Re-defining a preset string?
            bne.s   old_scalar
*
* It's a string; deallocate and re-allocate space IF NECESSARY...
*
            lea.l   4(a0),a3          Make A3 point at the data handle
            move.l  (a3),a0           Find the current data area
            move.l  -4(a0),d1         Find maximum space for text here
            subq.l  #6,d1             Ignore both .L & .W prefixes
            cmp.w   0(a1,a6.l),d1     Will the altered text fit inside?
            bcc.s   str_fits
*
* De-allocate the old space and find some anew
*
            trap    #0                Prevent scheduling of other tasks
            move.w  #16,-8(a3)        Shrink the descriptor
            addq.l  #6,d1             Don't forget room for the lengths
            move.l  a3,d7             Preserve address of the data pointer
            subq.l  #4,a0             Step back to heap block length
            lea.l   sentinel,a1       Release to my heap sentinel
            move.w  $DA\w,a2          Get MM.LNKFR vector
            jsr     (a2)              Release it!
            moveq   #1,d1             An odd byte, to get the size started
            moveq   #-1,d5            Special type for ALTERed strings
            move.l  $58(a6),a1        Find the parameter stack again
            bra.s   new_string        Store the ALTERed text
*
str_fits    moveq   #1,d4             Allow for an odd byte length
            add.w   0(a1,a6.l),d4
            lsr.w   #1,d4             Count words for DBRA
            bra.s   re_set
*
* Plug the new value into the scalar slot...
*
old_scalar  addq.l  #4,a0             Skip the code address (check it?)
            moveq   #2,d4             Presumed length 3 words for DBRA
            cmp.b   #float,d5         Is it a float?
            beq.s   re_set
            moveq   #0,d4             No, just an integer
re_set      trap    #0                Stop over-eager tasks misreading
            bra     data_store
*
neophyte    trap    #0                Prevent multi-tasking temporarily
no_release  moveq   #16,d1            Size = 4(LEN) + 6(JMP) + 6?(DATA)
            cmp.b   #string,d5        Strings have special requirements
            beq.s   new_string
            cmp.b   #float,d5         Floating point? (6 bytes DATA)
            beq.s   space_set         Yes, D1 was guessed right
            moveq   #12,d1            No, integer, D1 should be 4+6+2
            bra.s   space_set
*
new_string  addq.l  #6,d1             Allow for string spacer & long header
            add.w   0(a1,a6.l),d1     Still works if total overflows 32K
space_set   move.l  d1,d4             Save the required size for later
alloc_d1    lea.l   sentinel,a0       Find the start of the user heap
            move.w  $D8\w,a2          Get MM.ALLOC vector
            jsr     (a2)              Find D1 bytes
```

```
            tst.l   d0              N.B. Explicit test NECESSARY here
            beq.s   count_up        Set them, if they were found
*
* Find more room for data in my heap; clobbers D0-3, A0-3
*
find_more   move.w  heap_lump,a0    Implicitly EXT.L A0
            move.l  d4,d1           D1 is space required
            cmp.l   a0,d1           Will it fit the next lump?
            bhi.s   get_plenty      If not, get room PLUS a lump
            moveq   #0,d1           No extra needed...
get_plenty  add.l   a0,d1           Find the space needed
            moveq   #0,d2           Get RAM owned by SuperBASIC
            moveq   #24,d0          Set MT.ALCHP trap key
            trap    #1              Ask for Common Heap space
            tst.l   d0              Did we get it?
            bne     super_stop
            moveq   #16,d2          Forget the 16 byte ALCHP header
            sub.l   d2,d1           D1 is the size of the available spac
            lea.l   sentinel,a1
            move.w  $DA\w,a2        Get MM.LNKFR vector
            jsr     (a2)            Link the new space into the heap
            move.l  d4,d1           Remember what we originally wanted
            bra.s   alloc_d1        Go back for it
*
* Count data words to be copied from RI stack to my heap, and make code
*
bad_vector  moveq   #-15,d0         Reject odd vector parameter values
            bra.s   super_stop
*
make_ptr    btst    #0,1(a1,a6.l)   Check it's an even word!
            bne.s   bad_vector
            lea.l   read_ptr,a2
            bra.s   word_count
*
make_nums   lea.l   read_int,a2     Point to integer code
            cmp.b   #integer,d5     But is it an integer?
            beq.s   word_count      Phew...
            lea.l   read_float,a2   No, FLOAT is Hobson's choice
            bra.s   word_count
*
count_up    move.l  $58(a6),a1      Find the parameter stack again
            tst.b   d5              Identify revived strings now
            bpl.s   make_code       Create the code for a new name
            move.l  d7,a2           A2 -> code handle to string text
            addq.l  #4,a0           Step past the extension entry length
            move.l  a0,(a2)         Make the handle point at the new tex
            lsr.w   #1,d4           Prepare to count in words
            subq.l  #3,d4           Discard 2 prefix words & 1 for DBRA
            bra.s   data_store
*
make_code   cmp.b   #string,d5      Check the data-type
            bcs.s   make_ptr        If less than one presume 0, VECTOR
            bhi.s   make_nums       It's higher than 1, FLOAT or INTEGER
            lea.l   read_str,a2     Point to string-fetching code
            sub.w   #9,d4           Round up & forget extra string data
word_count  lsr.w   #1,d4           Count words not bytes
            subq.w  #6,d4           Discount 5 prefix words + 1 for DBRA
*
```

to do this automaticaly. Old Sinclair roms do not let you use toolkit procedures or functions unless the extension code was loaded before any attempt to use that name in a current program line or command.

SHOW_HEAP uses two resident constants, SENTINEL and HEAP_START. Both of these are derived from X, the address where the code is loaded. SENTINEL is SET TO X+12 – the offset of the sentinel pointer after the start of the SET or ALTER code. HEAP_START should be set immediately after SENTINEL. It holds the address of the first entry in the User Heap.

Unusued

Just after SENTINEL is SET, the long word value it addresses holds the 'offset' or relative pointer of the unused space in the User Heap. At this stage only the first 16 bytes will be allocated, to SENTINEL itself, and the free space will come immediately thereafter.

The function FREE HEAP uses a similar technique to find the size of the *first* free space available in the User Heap. It does not necessarily find the largest space, as free memory is kept in a list in order of address.

Listing one follows the usual format, except for one *QL Devpac* quirk: I have specified word sizes for the Qdos vectors with \W. Other assemblers expect MOVE.W $110.W, A2, rather than the backslash favoured by Hisoft. This complication saves a few bytes of code, and means that I can rely on fixed offsets of 10 and 12 bytes from the start of the code to the HEAP_LUMP and SENTINEL variables.

Encoded

In that example the first .W indicates that word value is to be read from memory into register A2. The second .W indicates that the address $110.W is to be encoded as a word, -32768 to 32766; Motorola won't let us read words from old addresses. The vector word is automatically extended to 32 bits by the transfer to the address register; this implicit EXT.L takes the 68008 an extra 267 nanoseconds.

The value-fetchers locate their data using the address put onto the stack by the JSR instruction. This code is re-entrant, so that any number of tasks can call the code at the same time. A READ_# routine might be used by several tasks at once, or in succession, to fetch the same or different values.

The Qdos scheduler might suspend one task as it was running READ_STR, and run another task through the same code. This works fine, as the READers are not self-modifying and lack internal data areas.

The things that decide the resultant value are held in registers and on the A7 stack, maintained separately for each task.

READ_PTR uses a simple loop to normalise address values, shifting one bit position at a time. The binary NORMALISE routine I have listed before is faster, but more complicated. The disk version includes yet another variant, optimised for some common Qdos pointer values.

SET itself is not re-entrant as it contains internal data, the user heap pointer, which might be modified by several tasks. The code takes care to avoid muddles by switching multi-tasking on and off at crucial moments. You must put the pointer at a known ram address and re-assemble the code if you want to run it from eprom.

The first part of SET puts the first parameter type, or 0 for a system pointer, into D5.B. A corresponding second parameter is evaluated onto the (A1, A6) stack, and (A4, D7) points at the relevant SuperBasic Name Table entry.

The code labelled LOOKUP resembles that of the name LOOKUP% function from September 1990, but it converts names to CAPITALS for consistent checking, and rejects names that do not correspond to a SET value.

This check assumes that only SET code will start with a JSR.L instruction; these never appear in conventional relocatable extension code. You should not try to ALTER names that have never been SET. 'Bad parameter' or 'in use' reports are the most likely result.

The code that manages the User Heap is executed in Supervisor mode, so that other tasks cannot interrupt before it has finished. This feature is vital if the code is extended to allow variables which can be changed by any task. There is no such requirement when data is being *read*, so this should not disturb multi-tasking unduly.

Remember that the stack pointer changes when Supervisor mode is selected by TRAP #0; RTS will not return to the caller unless we revert to user mode with ANDI $D8FF, SR first.

You only need to call two new system vectors to manage a User Heap. MM.LNKFR releases space, MM.ALLOC allocates it. Note that the two calls use different registers to address the sentinel. Basic routines that use the heap often to re-load A1 from the Sytem Variable BV.RIP, as its value is clobbered by the Heap routines.

Don't be tempted by Manager Trap #1 routines MT.ALLOC or MT.LNKFR. These custom versions for the SuperBasic interpreter suspend multi-tasking and use fiddly A6-relative pointers. They were tacked onto Qdos 1.00, the FB rom, replacing the Supervisor traps MT.SUPVS and MT.SUPEX of version 0.08, the last 'pre-release' Qdos.

From NORELEASE onwards SET finds room for the new value and associated code in the User Heap, generates an appropriate amount of code, and sets the Name Table entry directly. This is not the

```
make_value move.l   (a0)+,d1          Recall the total heap block length
           move.l   a0,4(a4,d7.l)     Set a Task 0 Name Table code pointer
           move.w   #call_code.(a0)+  Store a JSR.L instruction
           move.l   a2,(a0)+          Store the address of the data fetcher
           move.w   #$0900,0(a4,d7.l) Mark this Name as a Resident Function
           subq.b   #string,d5        Is this a string?
           bne.s    data_store        If not, we have almost finished
           lea.l    10(a0),a2         Find address of string (4+2+4 later)
           move.l   a2,(a0)+          Put it after the call
           addq.l   #2,a0             Skip to the next user heap block
           moveq    #16,d2            Size of the first part
           sub.l    d2,d1             D1 is size of the remaining part
           move.l   d1,(a0)+          Store the block size of part 2
data_store move.w   0(a1,a6.l),(a0)+  Copy data words to my heap
           addq.l   #2,a1             Advance up this task's RI stack
           dbra     d4,data_store     Count the data word(s)
super_stop andi     #$D8FF,sr         Return to multi-tasking user mode
           rts
*
define     dc.w     2                 Two procedures
           dc.w     set-*
           dc.b     3,'SET'
           dc.w     alter-*
           dc.b     5,'ALTER'
           dc.w     0,0,0             End of Procs: no Functions (yet!)
*
           end
```

```
QL WORLD DIY TOOLKIT Listing 2, page 1 of 2


100 REMark Sinclair QL World HEX LOADER v 3
110 REMark by Marcus Jeffery & Simon N Goodwin
120 :
150 CLS: RESTORE : READ space: start=RESPR(space)
160 PRINT "Loading Hex..." : HEX_LOAD start
170 INPUT "Save to file...";f$
180 SBYTES f$,start,byte : STOP
190 :
200 DEFine FuNction DECIMAL(x)
210 RETurn CODE(h$(x))-48-7*(h$(x)>"9")
220 END DEFine DECIMAL
230 :
240 DEFine PROCedure HEX_LOAD(start)
290 byte = 0 : checksum = 0
300 REPeat load_hex_digits
310    READ h$
320    IF h$="*" : EXIT load_hex_digits
330    IF LEN(h$) MOD 2
340       PRINT"Odd number of hex digits in: ";h$
350       STOP
360    END IF
370    FOR b = 1 TO LEN(h$) STEP 2
380       hb = DECIMAL(b) : lb = DECIMAL(b+1)
390       IF hb<0 OR hb>15 OR lb<0 OR lb>15
400          PRINT"Illegal hex digit in: ";h$ : STOP
420       END IF
430       POKE start+byte,16*hb+lb
440       checksum = checksum + 16*hb + lb
450       byte = byte + 1
460    END FOR b
470 END REPeat load_hex_digits
480 READ check
490 IF check <> checksum
500    PRINT"Checksum incorrect. Recheck data.":STOP
520 END IF
530 PRINT"Checksum correct, data entered at: ";start
560 END DEFine HEX_LOAD
570 :
580 REMark Space requirements for the machine code
590 DATA 760
600 :
```

```
QL WORLD DIY TOOLKIT Listing 2, page 2 of 2

610 REMark Machine code data
620 DATA "43FA02E034780110","4ED203F000000000"
630 DATA "7202616A205F3390","E80078034E757206"
640 DATA "615C205F36107000","4E41243030002202"
650 DATA "670C323C08205341","D4826AFAE28A3381"
660 DATA "E8002382E8027802","4E757206130205F"
670 DATA "3398E8002390E802","78024E75205F2050"
680 DATA "7203D25008810000","6114E24C53442449"
690 DATA "3598E800548A51CC","FFF878014E752801"
700 DATA "4A2E00546B063278","011A4E91226E0058"
710 DATA "93C42D4900587000","4E757AFF60027A01"
720 DATA "49EB0010BBCC6624","7400720070024E41"
730 DATA "28484A856B1A1A33","E801671008050007"
740 DATA "67027A001233E800","670000B470F14E75"
750 DATA "4BEB00082E0D3078","01164E9066F03031"
760 DATA "E80067E832004BE9","000274DFC531E802"
770 DATA "5289534066F64A05","67161631E8017A01"
780 DATA "B63C0004670A7A03","B63C000567027A02"
790 DATA "4E40206C0018202C","001C262C00203670"
800 DATA "C802D7C3B233C800","670C5088B08862EE"
810 DATA "70F9600001A81833","C801C802B835E800"
820 DATA "66E83C0155466B16","224D1833C802C802"
830 DATA "528B5289B831E800","56CEFFF066CC0C30"
840 DATA "0009C800670670F7","60000172027CD8FF"
850 DATA "26474BEB00082E08","601470F14E753E33"
860 DATA "E8026FF648C7E78F","DEAE0018508B0205"
870 DATA "000F180566027803","4884D84491C890C4"
880 DATA "306801184E9066D4","4A34780067602074"
890 DATA "78040C584EB966C2","BA3C0001663E47E8"
900 DATA "0004205322286FFFC","5D81B271E8006422"
910 DATA "4E40377C0010FFF8","5C812E0B598843FA"
920 DATA "FE2C347800DA4E92","72017AFF226E0058"
930 DATA "60307801D871E800","E24C600C58887802"
940 DATA "BA3C000267027800","4E40600000C64E40"
950 DATA "7210BA3C0001670A","BA3C0002670A720C"
960 DATA "60065C81D271E800","280141FAFDE03478"
970 DATA "00D84E924A80674E","307AFDD02204B288"
980 DATA "62027200D2887400","70184E414A806600"
990 DATA "008C7410928243FA","FDB4347800DA4E92"
1000 DATA "220460C670F16074","08310000E80166F4"
1010 DATA "45FAFDAC603445FA","FD98BA3C0003672A"
1020 DATA "45FAFDC86024226E","00584A056A0C2447"
1030 DATA "58882488E24C5784","6038BA3C000165C8"
1040 DATA "62D445FAFDB80444","0009E24C5D442218"
1050 DATA "2988780430FC4EB9","20CA39BC09007800"
1060 DATA "5305660E45E8000A","20CA54887410928 2"
1070 DATA "20C130F1E8005489","51CCFFF8027CD8FF"
1080 DATA "4E750002FDBA0353","4554FDB005414C54"
1090 DATA "4552000000000000","*",69093
```

```
QL WORLD DIY TOOLKIT LISTING 3, page 1 of 1

100 REMark Simple User Heap scanner SNG v3.4 1/3/91
160 :
170 x=RESPR(1024) : LBYTES "flp1_ALTER_CODE",x : CALL x
200 SET SENTINEL TO x+12 :REMark This MUST follow the LBYTES
210 SET HEAP_START TO PEEK_L(SENTINEL)+SENTINEL-16
240 REMark The -16 ensures that SENTINEL is itself shown
290 SHOW_HEAP : STOP
300 :
350 DEFine FuNction FREE_HEAP
360 REMark Returns size of the FIRST free space in the SET HEAP
370 RETurn PEEK_L(PEEK_L(SENTINEL)+SENTINEL-4)
380 END DEFine SHOW_HEAP
390 :
400 DEFine PROCedure SHOW_HEAP
410 LOCal p,f,length
420 REMark Shows used/free entries from the first SET heap block,
430 REMark as long as you set up SENTINEL and HEAP_START as above.
440 LET p=HEAP_START : LET f=SENTINEL
450 REMark Skip over any extension blocks at lower addresses...
460 REPeat seek: f=f+PEEK_L(f): IF PEEK_L(f)=0 OR f>=p: EXIT seek
470 CSIZE 1,1 : PRINT "Heap address" TO 15;"Bytes" : CSIZE 1,0
480 REPeat loop
490   LET length=PEEK_L(p-4)
500   PRINT " @ ";p-4; TO 14;length!!
510   IF p=f : PRINT 'free' : f=f+PEEK_L(f) : ELSE PRINT 'used'
520   IF PEEK_L(p)=0 : EXIT loop
530   LET p=p + length
540 END REPeat loop
550 END DEFine SHOW_HEAP
```

official way of doing things, but I have found it effective on a range of QLs and clones from Sinclair's JM to Sigma FP, Minerva 1.64 and Argos 6.41.

Bugs in AH and JM roms would make the name inaccessible to the current program if I followed the rules and tried to set it with BP.INIT. Once the Name Table entry is POKEd the new name works just like a Resident Function.

The ALTER_ASM file outlines a method of calling BP. INIT from SET. This would allow compiled tasks to create Resident variables and constants, but could cause annoying mistakes. If you mistakenly SET a name that already has a value the code would create a new name, corresponding to the odd value.

I decied that this 'improvement' was not worth the problems it might bring. In any case, inter-task communication is easy as long as you create Resident Variables with SET commands in your SuperBasic BOOT program or loader, *before* loading tasks. Once the name is known to the system any task can ALTER it or read the latest value.

Text and programs based on this series are available on disk or cartridge. **DIY Toolkit Volume U** explores User Heaps and User-made Functions. Volume U contains the full assembler and binary code for SET and ALTER, routines that sift the contents of the Common Heap and SET User Heaps, plus extra documentation and scores of useful constants and vectors.

The 15 Volumes of *DIY Toolkit* cost £3 each, plus a processing fee of £4 per order. This covers first class or air mail delivery and 3.5 or 5.25 inch disk media; microdrive cartridge orders must come with one formatted cartridge for each volume required. To obtain DIY files, or a catalogue, ring Richard Alexander on (0559) 384574, or write to **DIY Toolkit, Cwm Gwen Hall, Pencader, Dyfed, Cymru SA39 9HA.**

Since 1987 DIY Toolkit has illustrated Qdos programming from concepts to testing, with short, interesting examples that fill the gaps in existing Toolkits. I enjoy your letters and am always on the lookout for new keywords or topics of interest to readers. Please send your requests to the QL World editorial address.

JANUS CONTACT

HARDWARE

Care Electronics
0923 672102
Peripherals and accessories.
Thor International
010 4533 930305
010 4533 937544
Digital Precision
081-527 5493
Discs, interfaces, drives, keyboards, RAM expansions.
EEC Ltd
0753 888866
QLs, peripherals, accessories
Miracle Systems
0904 423986
Trump Card interface, modems, hard disc drive.
Strong Computer Systems
0267 231246
Sector Software
0772 454328
Peripherals.
S.P.E.M
Via Aosta 16, 10154 Torino, Italy.
+39 11 857924 Fax +39 11280009
QL disk interfaces, ram, eprom holders.
TF Services
071 724 9053
Repairs, spares, peripherals.
TK Computerware
0303 812801
Peripherals.

SERVICES

Adman Services
0952 255895
Joe Atkinson
36 Ranelagh Road, London W5 5RJ
Roms, mdvs and all spares.
Suredata
081-902 5218
Repairs.
QL World
(reader services)
Subscriptions
091 510 8787 (Lazerhold)
Microdrive Exchange
0772 454328 (Sector)
Recent back issues : write to editor
Quanta
User Group, support.
Hon. secretary, Phil Borman.
0933 460690
Xchange User Group
Freepost
Beckenham
Kent BR3 2BR

SOFTWARE

Athene Consultants
0705 511439
ARK Distribution
0983 79496
Archivist, Master Spy and other business and utility software.
Call Us What You Like
55 Greenan, Shaws Road, Belfast BT11 8LX. No telephone. Superspy.
Care Electronics
0923 672102
Tony Tebby software. Miracle hardware, peripherals, utilities.
CGH Services
0559384 574
Adventures. QLAF, DIY Toolkit.
Compware
0270 582301
Task Swopper, Mega Toolbox, Expert, System Shell, Speedscreen and others.
Digital Precision
081-527 5493
Turbo Basic compiler, Desktop Publisher, Editor, Eye-Q Graphics. Sprite generator, Super Forth, Better Basic, Professional and Super Astrologer, Media Manager, Supercharge, Blocklands, Driodzone, Aracadia, Reversi, Backgammon, Master Bridge Tutor, C-M Emulator, C compiler, Lightning speed enhancer.
DJW Software
0256 881701
Homebanker
Dilwyn Jones Computing
0248 354023
Home Budget, Vision Mixer, QL Genealogist, Textidy, Spellbound and others.
Eidersoft
089283 2552
Games utilities, Ice. Pyramide.
ImaQLate Software
42 Albion Street, Broadstairs, Kent CT10 1NE.
Biograph.
Jochen Merz Software
010 49 203501274
QL/Atari Emulators, utility and games software.
QFILE
Apartado 2110 p-1103 Lisboa Codex, MS-Link and Discopy. Portugal.
QL Supersoft
0256 475992
Spell, Numbers, Superdraw.
Rob Roy Software
94 Teignmouth Road, Clevedon, Avon BS21 6DR.
Rob Roy and Palantir.
Sector Software
0772 454328
Flashback and other utilities.
SD Microsystems
0462 422897
Business software including General Ledger. Small Traders' Pack/Invoicer and Stock Accounting.
Software 87
33 Savernake Road, London NW3 2JU
Text 87 and updates.
Talent Software
0303 813883
Utilities, games.
TK Computerware
0303 812801
Add-ons, spares, software.
WD Software
0534 81392

CLASSIFIED

If you would like to place a Classified Advertisement in the next issue of Sinclair/QL World, address it to:

Jason Newman,
Sinclair/QL World,
Panini House,
116/120 Goswell Road,
London EC1

on a plain piece of paper. Please also print your name, address, and daytime telephone number.

MICRO ADS
MICRO ADS
MICRO ADS
MICRO ADS
MICRO ADS
MICRO ADS

QL ROMS AND SPARES

ROMS. MGE (Spanish, MGF (French), MGG (German), JS (English), £20 each. JM (English), £10

MDVS. Complete QL MDV Subunit £20, head and chassis £10, Microswitch £2, Motor £6. Rubber & Plastic Roller £2. MDV2 Stand-off spacer + srew £2. ULA £5. Tr 4,5,6,7 set £2. MDV pcb inc. ULA £11. Prices include UK postage. Send SAE for price list of all QL spares.

Joe Atkinson, 36 Ranelagh Road, Ealing, London W5 5RJ (Mail Order Only).

NEW FROM
THE UTILITY ROOM QL DISASSEMBLER
ONLY £10

First in a range of S/W at affordable prices. Please send one formatted Microdrive to **5 Upton Way, Walshaw, Bury, Lancs, BL8 3BT.**

Disks unavailable at the moment and up-grades will be £2.00

Wanted: QL MULTI (5.25" & 3.5" Disk Drive) to replace drive which has gone temperamental. Roy Tuff, Town End Cottage, Ilam, Ashbourne, Derbyshire DE6 2AZ - phone 0335-29-429 (evenings).

Qfile programs: MS-QLink v.1.5 £12.00, DISCOPY v.2.06 £7.50, £17.00 together. Please state 3.5"/720KB or 5.25"/360KB. Cheques payable to T.F. Leal. Address: Qfile, Apartado 2110, P-1103 Lisboa Codex, Portugal.

QL-COMPUTER and Printer complete, hardly used, programs: Quill, Abacus, Archive and Easel, user guide + books, spare cartridges, £185.00. Tel 0273 559762 eves.

J.S. QL, colour monitor, HR5 printer 2 x 3½ disk drive, 512K expanderam. Software includes Cash Trader, DTP, Eye Q, Inkwell, Signwriter, Viewpoint plus more. £235.00. Tel 0473 717756.

ALL QL PARTS

Disk Interfaces, Parallel Interfaces, Eprom Boards, Backplane Boards.

Ring for details:

53 Gilpin Road, Admaston, Tilford, Shropshire, TF5 0BG.
Tel No: 0952 255895

QL REAL TIME DIGITIZER

Digitize moving pictures in real time. Transforms QL into a video printer or 3-D image digitizer via a video camera/recorder

* Digitizes in .02 secs.
* 256x256 resolution in 8 levels
* Full, ¼ or 4x ¼ screen modes
* Screen update - 5 or 2.7 frame/sec
* 1:1 grey level 9-pin printer dump.
* Interfaces to QL ROM PORT
* Runs on unexpanded QL and multitasks.
* Cost: £123.00 incl. State mdv or flp.

CL SYSTEMS, 403 CHAPTER ROAD, DOLLIS HILL LONDON NW2 5NG TEL: 081 459 1351

C.G.H. SERVICES

Cwm Gwen Hall, Pencader, Dyfed, Cymru, SA39 9HA
(Tel. 0559 384574)

Program	Type	Memory	flp	mdv
Anelpum Quat	Text Adventure	128K	£8.00	£8.00
Assault and Battery	Shoot 'em up	128K	£10.00	£10.00
Blag2	Text Adventure	256K	£8.00	£8.00
D-Day Mk II (Special Ed)	Wargame	256K	£13.00	£18.00
Double Block 1-2 Player	Tetris Game	128K	£9.00	£9.00
Dreamlands	Text Adventure	256K	£8.00	—
From the Tower of Valagon	Text Adventure	128K	£8.00	£8.00
Grey Wolf	U-Boat Simulator	256K	£9.00	£12.00
Here We Go	Text Adventure	128K	£8.00	£8.00
MacSporran's Lament	Illustrated Adventure	128K	£8.00	£8.00
Open Golf	Golf Simulator	384K	£10.00	—
Orbiting Stars	Astronomical Sim	128K	£8.00	£8.00
Personal Finance Manager	Home Accounts	128K	£8.00	£8.00
Polytext	Multi column Quill	128K	£16.00	£16.00
Quick Mandel Brot	Fractals	128K	£8.00	£8.00
Quiz Master	Quiz Game	128K	£8.00	£8.00
Return to Eden	Role-Play Adv	256K	£15.00	—
Sector X	Shoot 'em up	256K	£10.00	£10.00
Speedfreaks	Car Racing Game	128K	£10.00	£10.00
Starplod	Illustrated Adv	128K	£8.00	£8.00
The Gee Gee System	Horserace Prediction	128K	£8.00	£8.00
Uncle Loonie's Legacy	Illustrated Puzzle Adv	128K	£8.00	£8.00
Voyage of the Beano	Illustrated Adv	256K	£10.00	—
Voyage of the Beano	Text Adventure	256K	—	£12.00
Wreck Dive	Graphical Adv	128K	£8.00	£8.00

QL Survivors Source Book Directory £2.00

Please add 10% to all orders by post to cover p&p and other charges. We regret that we cannot deal with orders by Access or other cards. All monies must be in Sterling.

QL Keyboard direct connected	80.00
Disc interface	60.00
Disc drive single and dual	189.00
Cabinet PC style for QL in Kit	80.00
Video Digitalizer	120.00
QLrom for Eprom 16K rear	5.00
Internal Memory expansions 512K	90.00
Hard Disc system 20 Mb for QL	320.00
Qeprom for 192 K EPROM	40.00
Programs MandelQuickly	20.00
Professional CAD for PCB	90.00
Qconnect Interface with 28 digital I/O	

Price Ex VAT inc. P&P

SPEM

via Aosta 86, 10154 Torino, Italy
Tel +39 11 857924 Fax +39 11 280009

SINCLAIR

THE PREMIER MAGAZINE

QL

FOR SINCLAIR QL USERS

For one month only, Sinclair QL World is offering you the chance to subscribe for 12 months and receive 14 issues. Yes, that's 2 free issues! Subscribe now!

The first issue of a new subscription to be delivered will be one or two issues after the one you placed your order in

Please send me one year's subscription to **Sinclair QL World.** I enclose my cheque/money order for £..... made payable to MCPC LIMITED or debit my Access/Visa card.
Offers closes 31st May 1991

Card No. | | | | | | | | | | | | | | | | |

Expiry date | | | | | | |

Name .....

Address .....

.....

Postcode ..... (Please enter postcode to ensure prompt delivery)

Signed ..... Date..... SQLW0591

Send to: M.S.M. Subs. Dept., Lazahold Ltd., P.O. Box 10, Roper Street, Pallion Ind. Estate, Sunderland SR4 6SN.

U.K.: £21.00, EUROPE: £32.00, REST OF THE WORLD: £38.00

OVERSEAS RATES INCLUDE AIRMAIL SERVICE